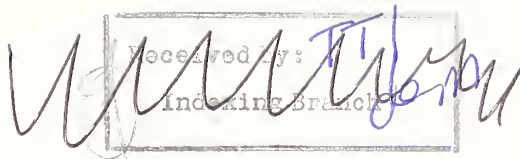


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Do not assume content reflects current scientific knowledge, policies, or practices.



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# Agricultural Outlook Forum '97

## Speech Booklet 3

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Exporting Cotton in an Uncertain Market

Allen A. Terhaar, Executive Director, Cotton Council International

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## EXPORTING COTTON IN AN UNCERTAIN MARKET

Allen A. Terhaar  
Executive Director  
Cotton Council International

Although it seems like only yesterday, from what I can tell it appears that it has been 15 years since I last spoke to a USDA Outlook conference. At that time I was working as an economist with USDA's Foreign Agricultural Service in the grains complex, and made one of those fairly predictable supply and demand presentations about what went up and what came down during the course of the year.

I do not plan to do that today. In the instructions to speakers for these sessions, the Program Planning Committee stated that it was "interested in obtaining independent views of future trends and issues". I am going to go out on a limb to make some predictions today that are meant to stimulate discussion. They are, indeed, independent and personal views and in no way are meant to represent the official outlook of the National Cotton Council or Cotton Council International.

When it comes to cotton's role in the world market for the next 5 years or more, some outcomes are as predictable in my mind as the Lunar Eclipses that Herman Kohlmeyer will tell us about at lunch. Other developments are about as difficult to forecast as the prices that Mr. Kohlmeyer will also tell us about.

Here are some of my predictions:

1. Cotton will continue to gradually lose market share in the world fiber markets.
2. Trade in raw cotton will lose share to processed cotton product trade.
3. A continued shift will occur in cotton spinning, fabric formation and garment assembly from more developed to lesser developed economies, **except in the case of the United States.**
4. Cotton's fortunes will depend on establishing itself as a premium fiber, not a bulk product for the masses.
5. Technical developments in cotton fiber characteristics, quality identification and preservation, high-speed processing and new product development will play an even more important role in the future than in the past.

6. Wider swings in cotton production will occur worldwide in the next 10 years because of more intense competition with food crops than we have in the past 10 years.

I will only elaborate on a few of these predictions today.

#### Prediction (1): Cotton Will Lose Market Share

In my opinion we, as an industry, are still paying too much attention to what is happening with cotton supply and demand factors within the United States or even the cotton complex worldwide, and too little attention to the broader question of how cotton fits into the total world fiber equation and what factors will determine its long-term fortunes.

The main issue today for cotton globally is how it competes -- or does not compete -- within the overall fiber complex. The key variable in that complex is man-made fibers, particularly polyester.

World fiber consumption has increased dramatically since 1984. Total fiber use rose from 138.5 million bale equivalents in 1984 to an estimated 187.7 million bales in 1996. This is a 36% increase in fiber consumption in just 12 years -- a very positive fiber use growth that would indicate a solid expansion opportunity for cotton.

Unfortunately, world cotton consumption reached a peak in 1989 at 87 million bales, and by 1996/97 is projected by the ICAC to be 87 million bales, unchanged from the record of 1989.

The dissolution of the FSU had a profound effect on world cotton prices but also affected the incomes and purchasing ability of consumers in those republics. In the late 1980's the FSU was using 10.1 million bales of cotton. Recent estimates put FSU annual retail purchases of cotton at around 5 million bale equivalents. Retail purchase of man-made fiber experienced a similar reversal. Excluding the FSU, world retail cotton purchases have increased 4.5 million bale equivalents since 1989, with the U.S. accounting for 90% of the non-FSU change.

Excluding the FSU, since 1984 the world has added 19.2 million bales to annual cotton use. In fact, the Western Hemisphere has accounted for 11 million of those bales. The purchase of cotton products is concentrated in several large markets. North America, Latin America and Europe account for more than one half of all the new cotton purchases since 1984. The rest of the world, with its large population base, has added only 8.2 million bales.

In contrast to cotton, man-made fiber consumption in Asia has grown rapidly over the same period adding 32.3 million bale equivalents. This growth has accounted for fully 89% of the 36.3 million bales increase in world man-made fiber use. Man-made fiber consumption in the Western Hemisphere has grown only slightly in the past 12 years.

Asian consumer markets are widely expected to be the fastest growing fiber markets for the next ten years given current forecasts of GDP growth rates. Unfortunately, those same Asian markets are undergoing shifts in consumption from cotton to man-made. China, Pakistan and Bangladesh have seen steady growth in man-made fiber use while cotton has experienced a modest decline. The ASEAN market displays an even more striking increase in man-made fiber use.

Obviously, if total fiber consumption continued to increase while cotton consumption remained flat, world market share for cotton has slipped -- and my prediction is that it will continue to slip.

In most of the 1980's total annual consumption of man-made fiber and cotton were essentially equal. After 1990, man-made fiber use increased while the volume of cotton used annually remained largely unchanged. Among the man-made fibers, polyester was the moving force bringing growth in consumption. Increases in polyester use explain virtually all of the changes in man-made fiber consumption.

In fact, during the past five years a significant shift in the pattern of world fiber consumption has emerged. Between 1990 and 1995, polyester use grew 6.8% per year while cotton use barely changed. Several projections for the next five years place annual growth in polyester use at 7% while cotton increases at 1.3%.

What is happening in the man-made fiber arena? An explosion in production capacity began several years ago, mostly located in the Far East. In 1990, world synthetic fiber production capacity was 78.9 million bale equivalents, with 43% located in the Far East. Projections for the year 2000 put capacity at 140.5 million bale equivalents and the Far East possessing 60.8% of all production. If these expansion plans are realized, as NCC's Dr. Mark Lange pointed out, the Far East will have greater synthetic fiber production capacity in the year 2000 than the entire world capacity was in 1990.

The textile industries of China, Pakistan, India, Indonesia and other players in the region are crucial economic and social industries. As many as 100 million Indians are reportedly involved in the hand-loom and textile industry. Pakistan's largest export earner continues to be textile products, accounting for 60% of all foreign exchange earnings. These countries are concerned with providing adequate fiber supplies to these important industries.



Will further expansion of man-made fiber capacity take place? Almost certainly. Even though a some of the man-made capacity investment decisions were made in 1995 when cotton was trading at \$1.15 per pound and polyester was \$0.93 and prices for both are currently much lower, information on the cost of production for polyester in Asian markets indicates a break-even price in the range of 40 to 45 cents, or 50 to 55 cents per pound mill-delivered in Asian markets.

A number of textile producing countries, notably China, India and Indonesia have official policies to foster the development of man-made fiber production and to increase its relative share vis-à-vis natural fibers. In their view, when looking at the importance of the textile industry to their local and export economies, and looking at the burgeoning food demands of their populations, there is really little choice. As you are aware, in each of these major economies, government direction bears more weight than in more open economies.

Hence, my prediction that cotton will continue to lose market share for the next decade. The forecast is that cotton consumption will grow to 97.4 million bales by 2004. Man-made fiber use is currently estimated at 102.7 million bale equivalents and will grow to 121.7 million bales equivalents by 2004. These estimates place cotton's market share at 44.5% in contrast to 45.6% for 1996. I think that forecast market share may be optimistic.

Prediction (2): Trade in raw cotton will lose share to processed cotton product trade.

This is less a prediction than an observation of a trend that has been underway for several years now.

Examining the world cotton trade statistics for a trend, it is pretty hard to find one. In general, it would seem to be downward sloping over the longer term, with individual country shares depending on local production and the relative strength of domestic and overseas demand.

Superimposing world trade in cotton products on raw cotton trade, however, shows a definite trend toward trade in cotton textile products, and that trend has been going on for some years.

Looking more closely at the U.S. as an example, with the increase in U.S. cotton production in recent years (two of the last three being record production), this has translated less into an increase in raw cotton exports than into the further growth of value-added cotton yarn, fabric and finished good exports.

Are other countries undergoing a similar transition? Yes, Pakistan is another good example of this phenomenon.

Will the trend toward increased exports of value added cotton continue in the U.S. and elsewhere? Yes, with the possible exceptions of Australia and Argentina/Paraguay.

Whereas the processing of Central Asian cotton used to be done everywhere in the Soviet Union **but** in Central Asia, and is now done everywhere in the **world** but in Central Asia, you are already beginning to see investments in those countries that follow the Pakistani example. In other words, before too many years have gone by, we are likely to see Uzbekistan concentrating on yarn and fabric exports, and not as heavily on raw cotton exports.

It is interesting to note that this trend has not been nearly as evident in Argentina/Paraguay, but the picture could look quite different if we look at Mercosur as the region for processing and exporting Argentine cotton. With the addition of Brazil's huge cotton processing capacity, that region begins to look more similar to what is happening in the U.S., Pakistan, India and others. Only Australia may be left as the continent or subcontinent which will not see a major shift from raw cotton exports to value added cotton product exports.

Prediction (3): A continued shift will occur in cotton spinning, fabric formation and garment assembly from more developed to lesser developed economies, **except in the case of** the United States.

This prediction is related to the previous one in that most of the world's cotton producers, except the U.S. and Australia, are developing countries. The world's current top ten cotton producers are: U.S., India, Uzbekistan, Australia, Egypt, China, Pakistan, Turkey, Argentina, and Greece.

The shift of spinning, weaving and garment manufacture from developed to developing countries has been going on for generations already. The interesting thing is that the reverse seems to be taking place in the United States. To understand first of all why cotton processing is on the move, one should first look at what we call the industry life cycle. I will use the example of Korea.

Korea used to be somewhat of a cotton producer, and its citizenry relied mainly on natural fibers for their minimal fiber needs before Korea began intense industrialization. Once industrialization



began, Korea made textiles and textile exports a cornerstone of that industrialization, with a dramatic impact on its imports of raw cotton. Gradually, however, Korea -- like Japan, West Europe, and the United States -- began to run up against increasing costs of labor in particular, but other rising costs as well. Furthermore, virtually all of the cotton fiber as an input needed to be imported. Korea's textile industry began to lose competitiveness, exports dropped off, and Korean mills began to invest in Southeast Asia, Central America and, more recently, China.

Still, to come to the conclusion that Korea is a "has been" for cotton imports would be an incorrect conclusion. While raw cotton imports are certainly down and are likely to continue to decrease over time, Korea's imports of cotton yarn, fabric and finished goods is rising rapidly -- some of those imports coming from Korean mills that are now located offshore.

I have attempted to categorize countries according to where I see them fitting on the cotton industry life cycle chart. This was not a rigorous process, but a categorization that alerted me to the fact that we at Cotton Council International may need to treat markets differently depending on where they are on this industry cycle. Further definition is probably a good project for some economics graduate student.

Interestingly, China, until recently the world's largest cotton producer and the largest cotton processor, last year became a net cotton product importer. This is certainly like carrying coals to Newcastle! As when it occurred historically in the United Kingdom and elsewhere, the shift of the cotton processing industry inexorably marches on.

So, what makes the U.S. different?

Two factors. One is that our textile industry has invested somewhere on the order of \$2 billion per year for the past couple of decades in new technology and product development. The U.S. cotton textile processing industry can now count itself among the most efficient and low-cost in the world at least through the fabric stage, and probably all the way through the cut-piece stage.

Thus, the U.S. textile industry can compete, particularly in this hemisphere, with anyone. If we add to this U.S. competitiveness the proximity of low-cost sewing platforms in Central America and the Caribbean, the United States is globally competitive through the final product stage.

Couple this competitiveness with a reliable, quality and year-round available supply of almost any cotton type a manufacturer might want, and you have a situation where the United States is likely

to be the only developed country that bucks the trend toward migration of textile processing to developing countries.

Prediction (4): Cotton's fortunes will depend on establishing itself as a premium fiber, not a bulk product for the masses.

This prediction keys off on what is happening with man-made fibers, and gets to the heart of what Cotton Council International does.

Most of you are very familiar with the consumer promotion work of Cotton Incorporated here in the United States through the "Fabric of Our Lives" campaigns. U.S. producers and Cotton Incorporated can justifiably take much credit for and pride in the fact cotton's market share in the United States is at its highest point in 30 years. In the past 10 years alone, per capita U.S. consumption of cotton has increased by nearly 50 percent.

As we already saw from my previous comments, cotton has not met with similar success outside of the U.S.

Why? I think Cotton Incorporated's Dr. Berrye Worsham summed it up best in the following comment:

"A primary reason for the disparity in growth between the U.S. market compared with foreign markets is the fact that the U.S. market for fiber is largely driven by the consumer while fiber economics play the dominant role in markets abroad."

There is no way that cotton can compete on a price basis with 45 cent polyester! The fact is that cotton should **not even try** to compete with polyester on a price basis, but on a quality basis instead.

The previous challenge to cotton from man-made fiber 30 years ago was quite different from the current situation. Regardless of how performance ultimately turned out, man-made fiber initially had an allure as a new product with fashion statements, new product characteristics, new styles and new handling. In fact, polyester sold at a premium to cotton during part of that period.

This current challenge is largely price based.

We should not be discouraged, however. I believe there is an excellent opportunity for cotton to be a highly profitable crop here in the United States. It means marketing our product as a premium product -- not as a bulk commodity. Indeed, we have seen that happen the last couple of years as the U.S. price has exceeded the world average price by several cents, and U.S. cotton moving strongly into domestic and export markets.

From the consumer side, there is also hope. One of the themes we use in CCI's COTTON USA consumer promotion campaigns is that "Man Always Returns to Cotton". When you talk with consumers who can afford it in almost any country, their preference is for natural fibers, with cotton high on the list. The importance of cotton in the American cultural image (jeans, T-shirts, sportswear, etc.) adds fuel to this preference because of the penetration of this American "casual culture.

That is as much true in places like Europe and Japan, as it is in Brazil, China or Indonesia. The main difference between the former countries and the latter is that the bulk of the population can afford cotton products.

There appears to be a normal cycle that countries undergo as they move through the economic development cycle. During the subsistence agriculture and very early stages of development, natural fibers (cotton, wool, linen) tend to predominate because that is all that is available. As countries move up the development curve, consumers tend to switch to synthetic fibers because they are perceived to be modern, because they are durable (though not necessarily comfortable) through harsh wear and wash conditions, and they are low-priced.

Further up the development curve the consumer can afford to focus on fashion and comfort, and cotton excels at meeting these desires. At that point, we have the opportunity bring man (and woman) back to cotton -- and that is the consumer that our COTTON USA program is targeted at overseas.

This theory of the "life cycle of fiber demand" is another good project for a graduate student. In the meantime, there is hope that this resurgence of cotton in more developed markets is already occurring -- it needs fostering as it did here in the U.S. through Cotton Incorporated's successful efforts. That's why we feel it is highly important to maintain public sector/private sector export promotion programs such as USDA's MAP and FMD programs.

We cannot become complacent, however. Cotton is a natural fiber, a wonderful product that has improved its general fiber quality considerably during the past decades. But so has man-made fibers.

Which leads me to my next prediction --

Prediction (5): Technical developments in cotton fiber characteristics, quality identification and preservation, high-speed processing and new product development will play an even more important role in the future than in the past.

This is a prediction that I will leave to the technical experts, of which there are a number in this conference and certainly abound in the U.S. textile industry, Cotton Incorporated and the National Cotton Council.

For my supporting documentation for this prediction, I will only quote Mr. Andrew MacDonald of Brazil's Alpargatas Santista Textile company, a huge cotton user and a good customer of U.S. cotton. Mr. MacDonald, who is also chairman of the ITMF Spinners' Committee, said in a speech to this year's Beltwide Cotton Conference:

"The textile industry battles against rising costs but, with stable textile prices, the industry must look for productivity to defend the bottom line -- which means faster and faster, low-labor machines. This in return increases the percentage participation of cotton in the final cost. Now, if cotton cannot handle the high speeds required which, by the way, the modern synthetics can, then the migration will eventually be away from cotton, despite the popular belief as regards comfort and ecology."

The message -- clearly that cotton technology in all its forms will be ever more important to maintaining cotton's competitiveness as we move into the 21st century.

Prediction (6): We will see wider swings in cotton production worldwide in the next 10 years because of more intense competition with food crops than we have in the past 10 years.

This prediction, in many ways, has already been dealt with amply throughout this Outlook Conference. With the passage of the FAIR Act of 1996, the rules of the game changed for U.S. cotton producers, and for producers worldwide. We are now in an environment where crops will much more readily shift from one year to the next based on costs and prices.

I only want to add to that debate that the secular shift that seems to have occurred **away** from cotton production in many of the world's minor producers will continue to be replaced by increases in the world's major producers such as the U.S., Australia, Argentina, India, Pakistan,

China and even Uzbekistan. The first three of those countries will react quickly and readily to price changes and alternative crops. The latter three will be battling rapidly increasing needs for food crops and a dwindling supply of good arable land.

The market will determine the production response.

What about domestic mill use?

NCC's Dr. Mark Lange the following prediction at the Beltwide conference:

"If we can begin to see successes in the reduction of production cost in the U.S. then I think U.S. mill use could easily rise to 15 to 16 million bales in use by 2004. Taking advantage of the close proximity of low cost assembly in Latin America coupled with our high quality just-in-time yarn and fabric production we can supply product that moves from here to Latin America and then to world markets."

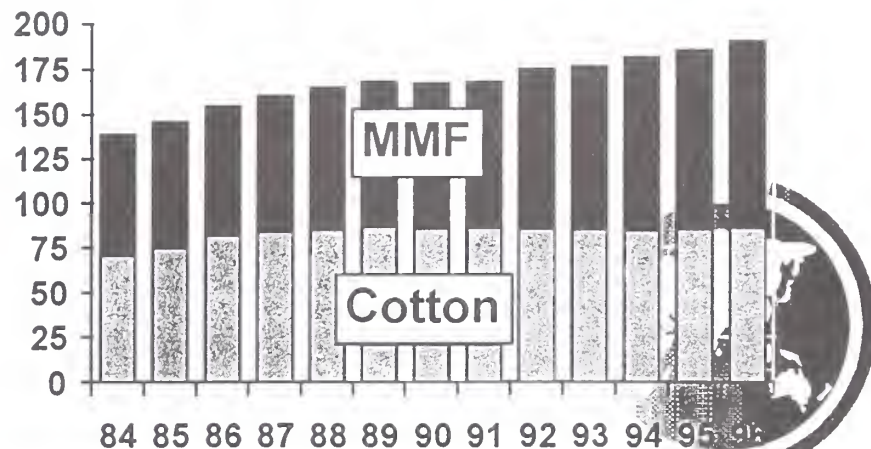
After many years of working in the grains area, I have the benefit of being a relative new-comer to the fiber side of the food and fiber equation. If my predictions pan out, we can chalk it up to beginners luck.

\* This paper draws heavily on a presentation made by Dr. Mark Lange of the National Cotton Council at the January, 1997 Beltwide Conference.



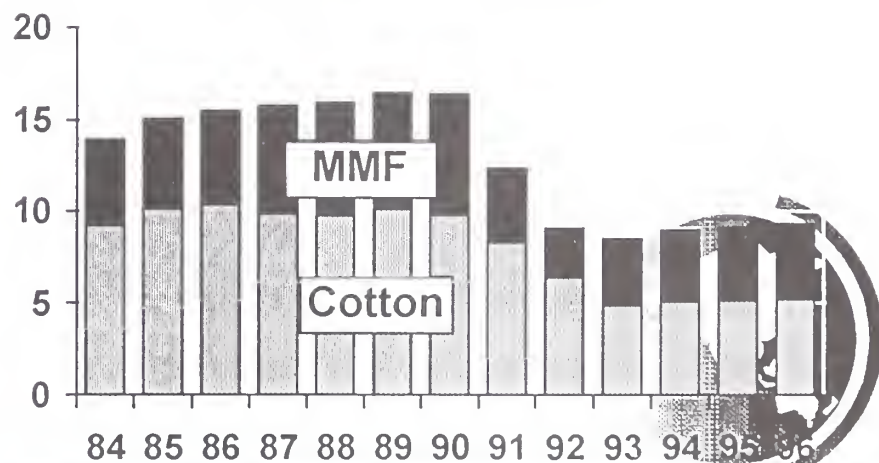
## World Fiber Consumption

Million Bale Equivalents



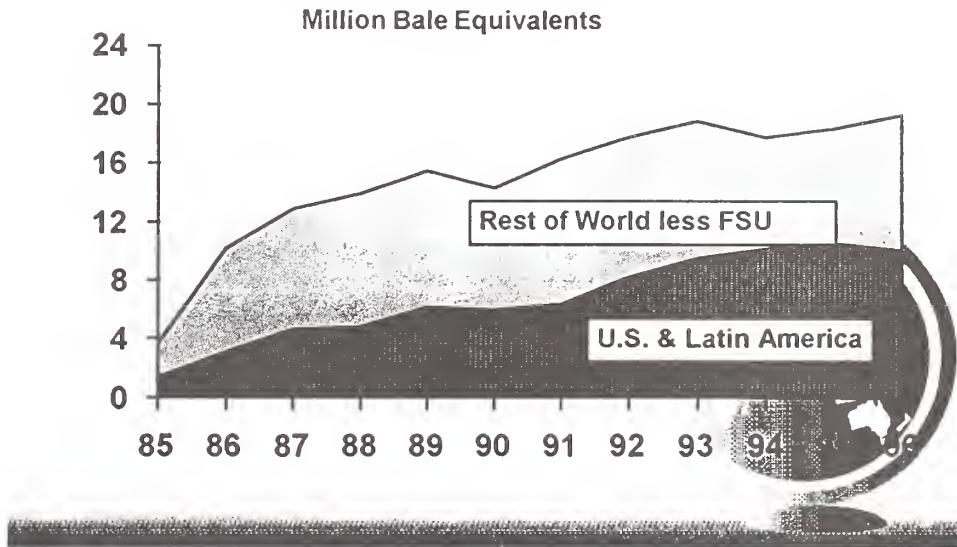
## FSU Fiber Consumption

Million Bale Equivalents

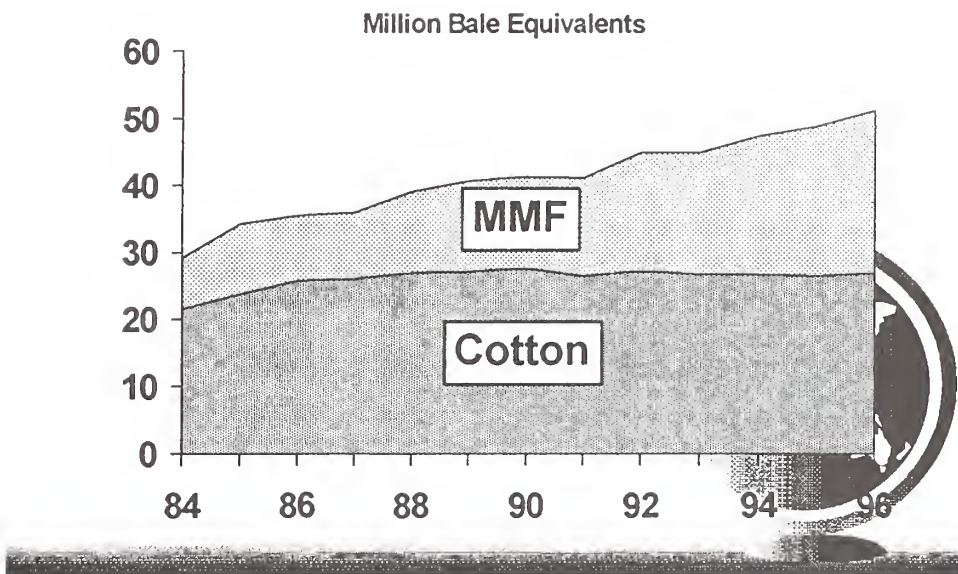




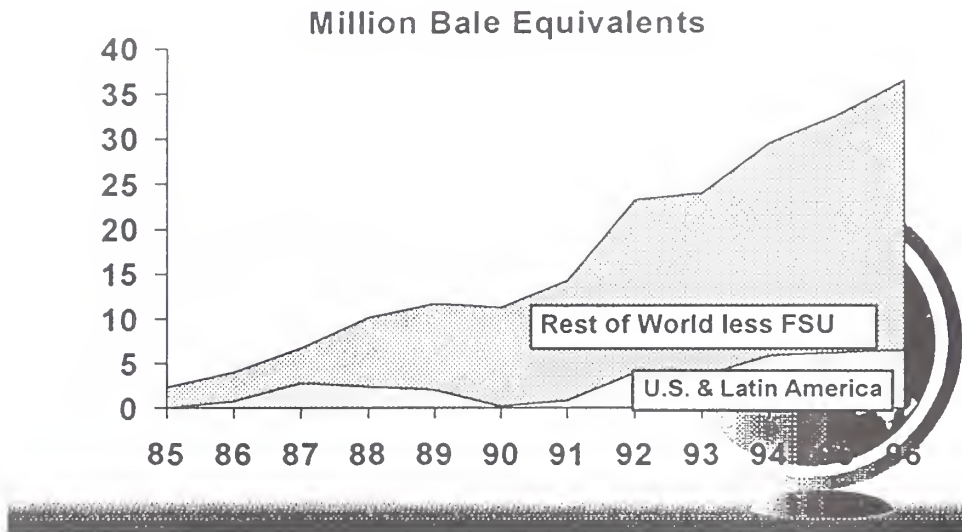
## Annual Addition to Cotton Use Since 1984



## ASEAN, China & Indian Sub. Fiber Use



## Annual Addition to MMF Use Since 1984

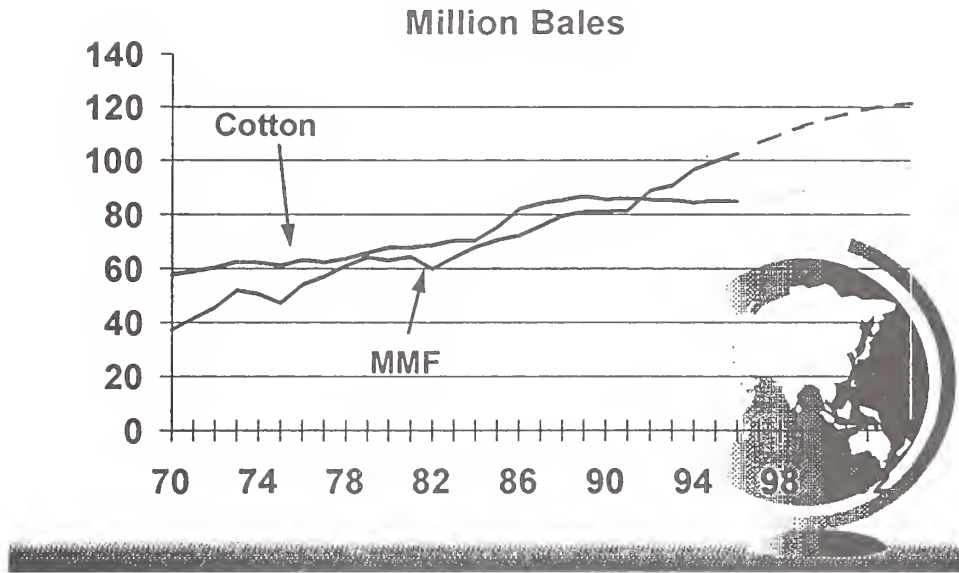


## Synthetic Fiber Capacity

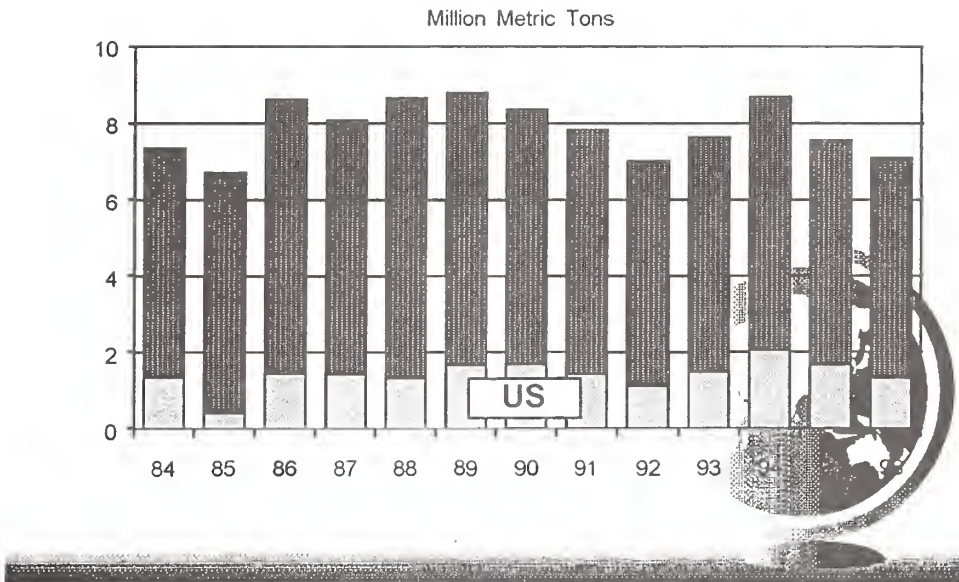
excludes cellulosic & polypropylene

	<u>1990</u>	<u>1995</u>	<u>2000</u>
Africa/M.E.	3.5%	4.0%	4.2%
Europe	27.3%	21.1%	16.3%
Americas	26.2%	22.9%	18.6%
Far East	43.0%	52.0%	60.8%
Mil. Bales	78.9	102.4	140.5

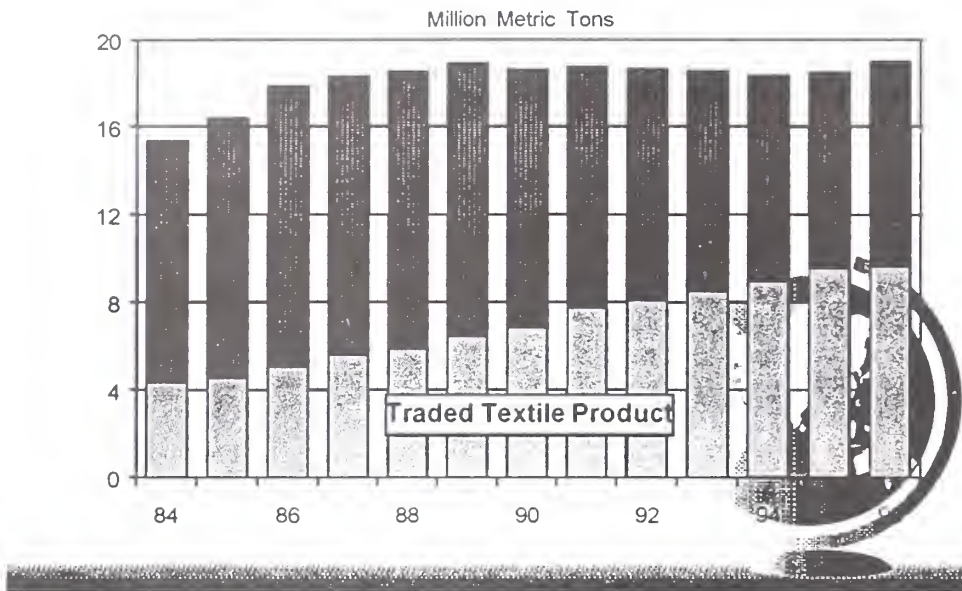
## World Consumption of Fiber



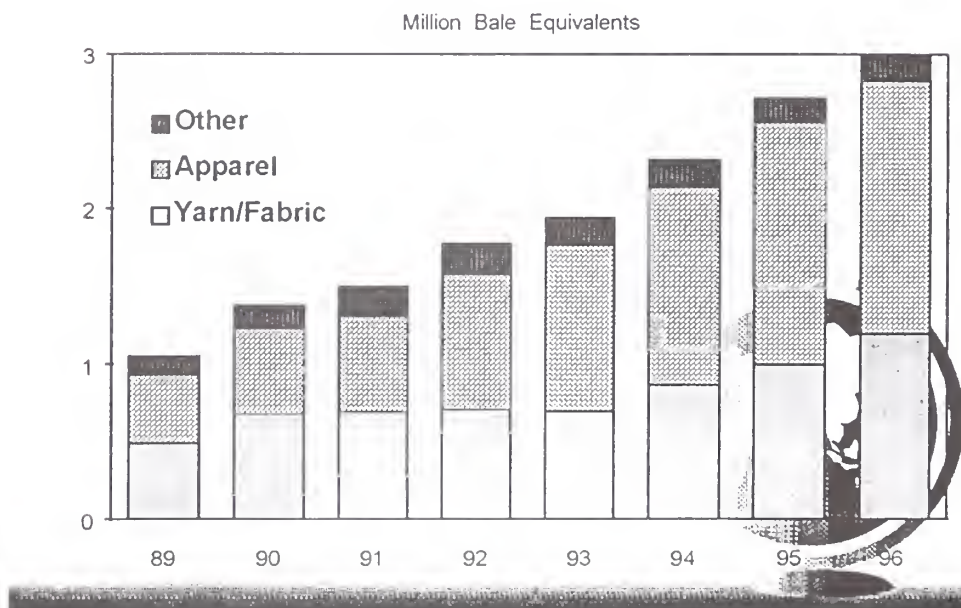
## World and U.S. Cotton Trade



## World Cotton Mill Use

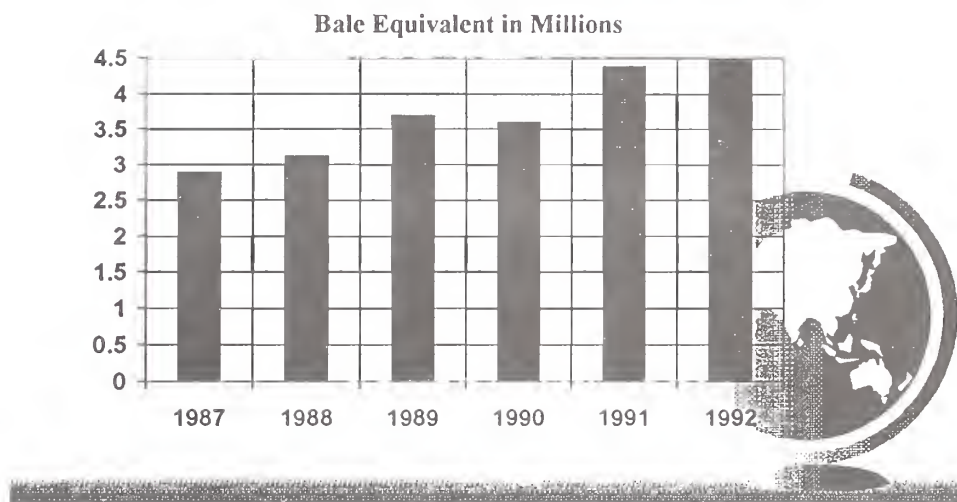


## U.S. Exports of Cotton Textiles

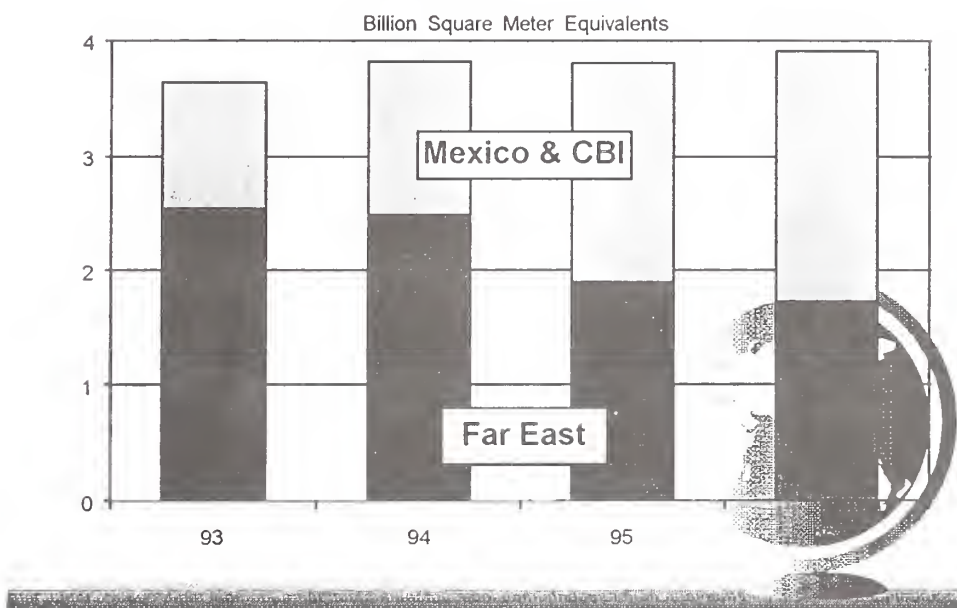




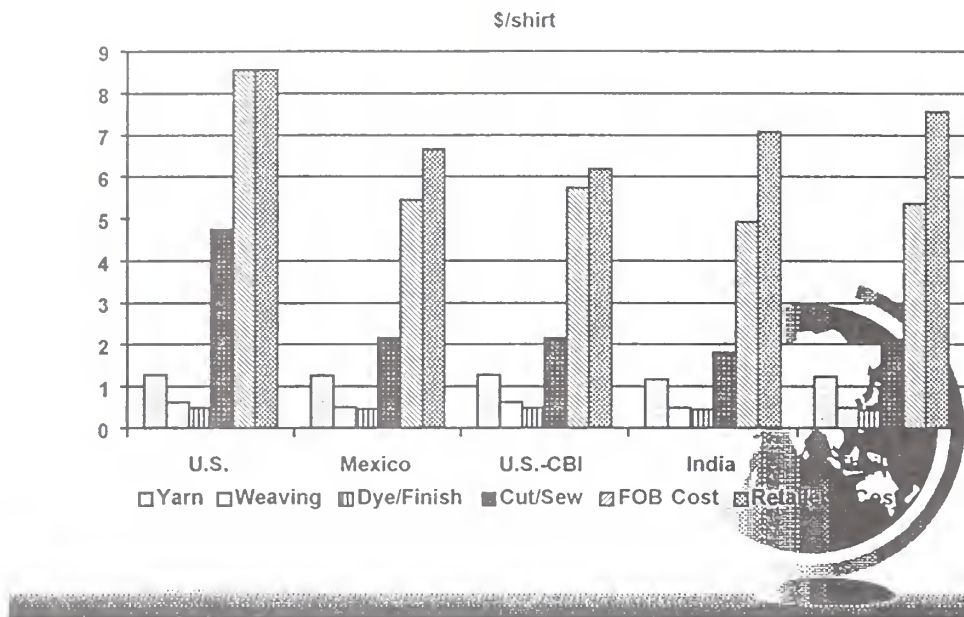
## Pakistani Cotton Textile Exports to the World



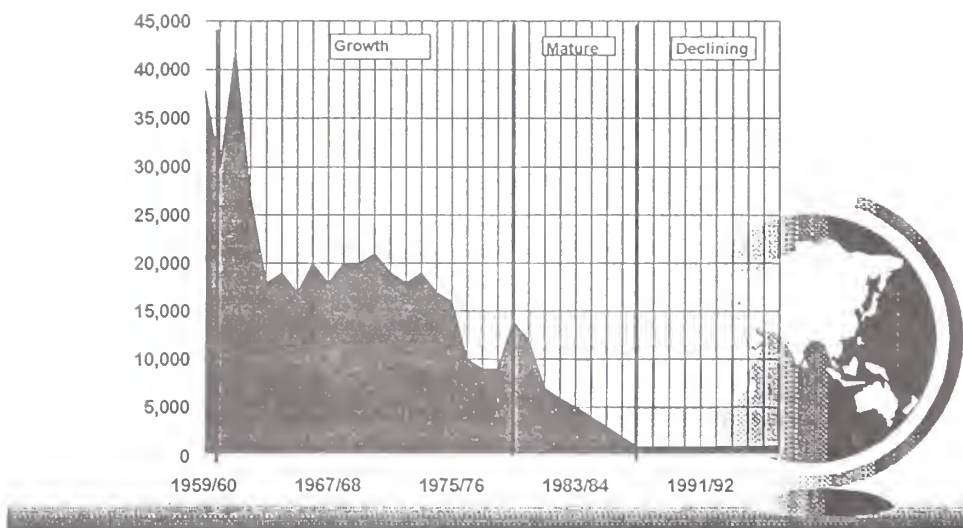
## Cotton Textile Import Sources



## Costs Components for Men's Shirt

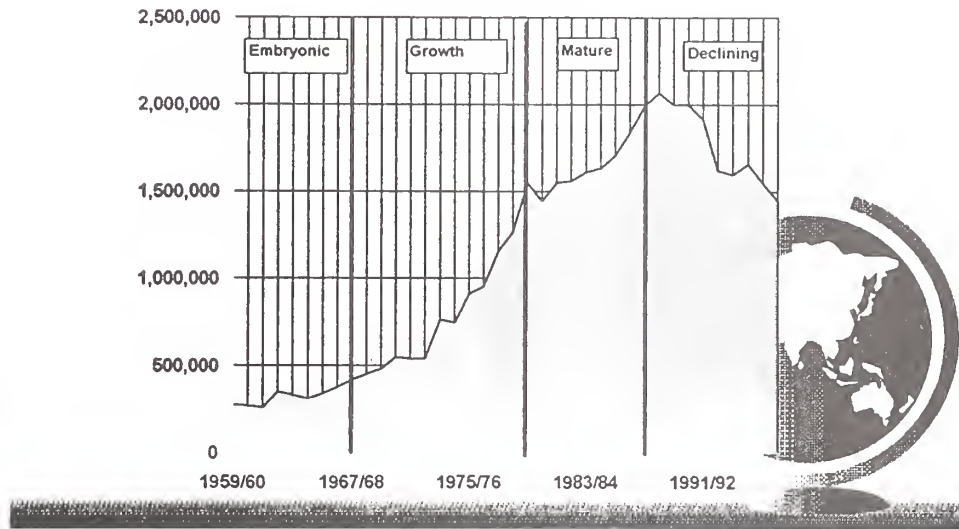


## Korea: Cotton Production (bales)

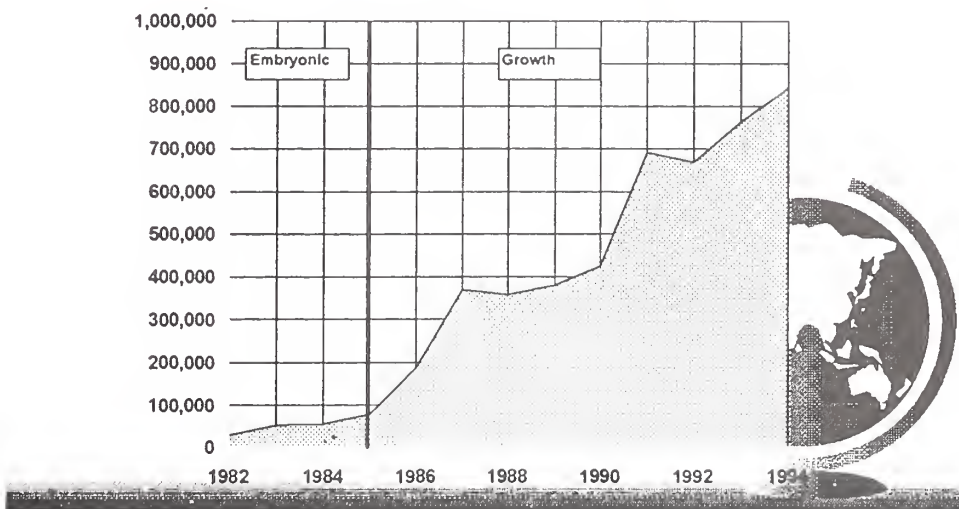




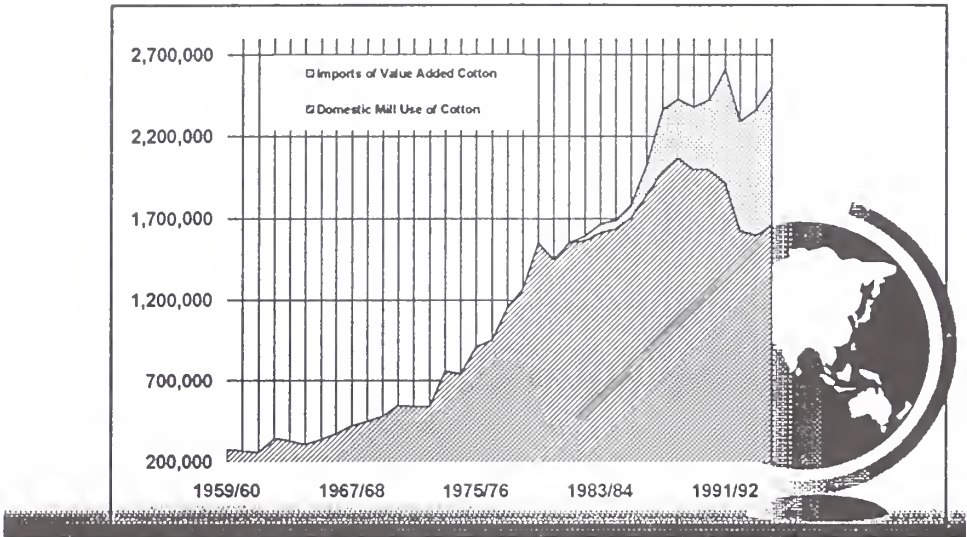
## Korea: Domestic Mill Use of Cotton (bales)



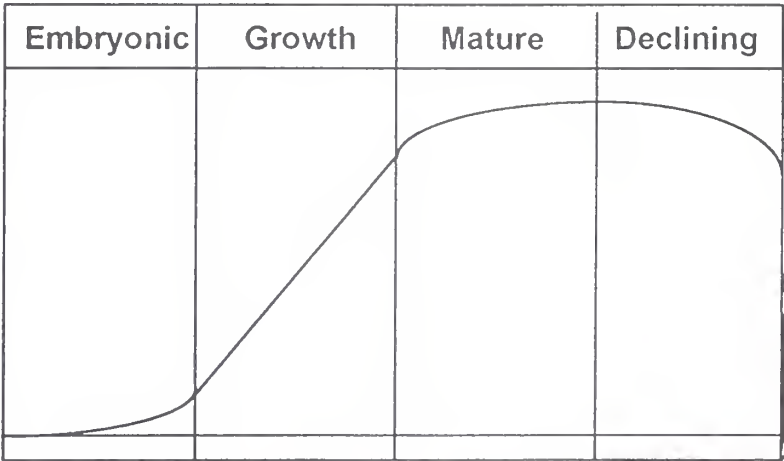
## Korea: Imports of Value Added Cotton (bale equivalents)



# Korea: Imports of Raw and Value Added Cotton (bale equivalents)

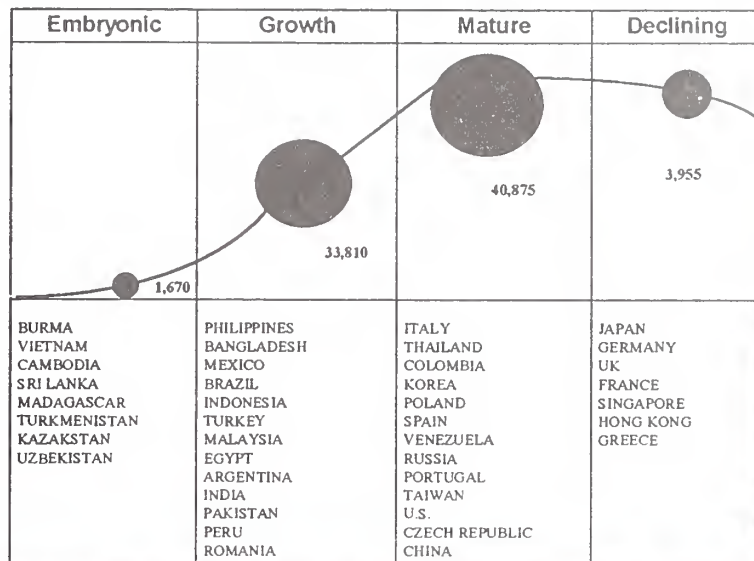


## Raw Cotton Industry Life Cycle

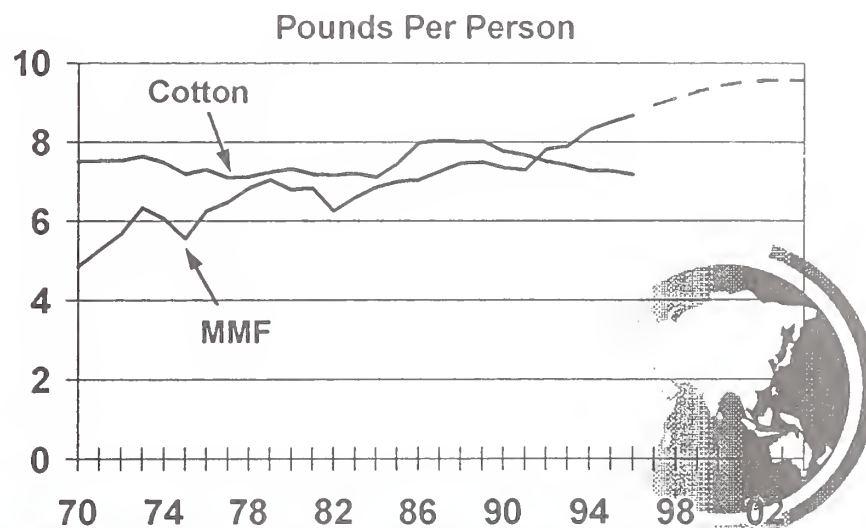


Market Growth  
Scope of Curve Represents  
Relative Growth Rate

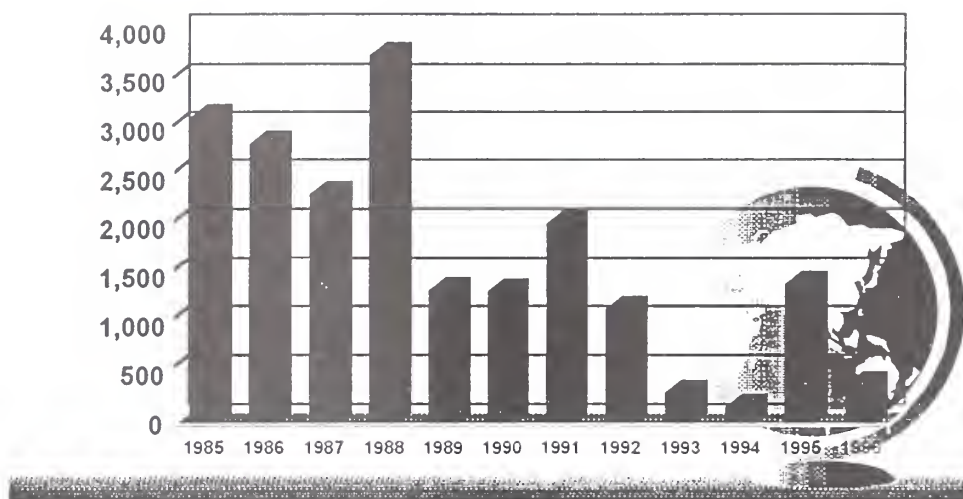
## Raw Cotton Mill Consumption -- Life Cycle Distribution



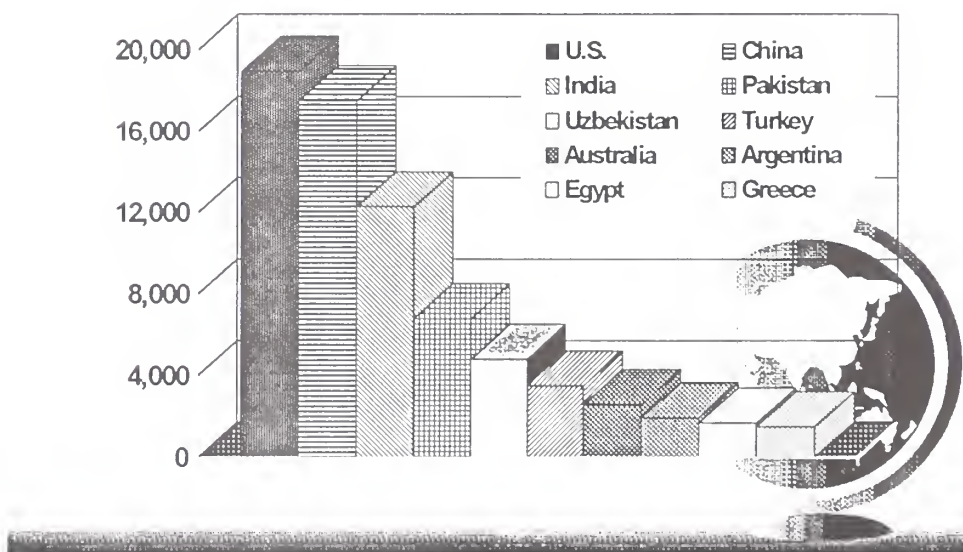
## World Per Capita Consumption of Fiber



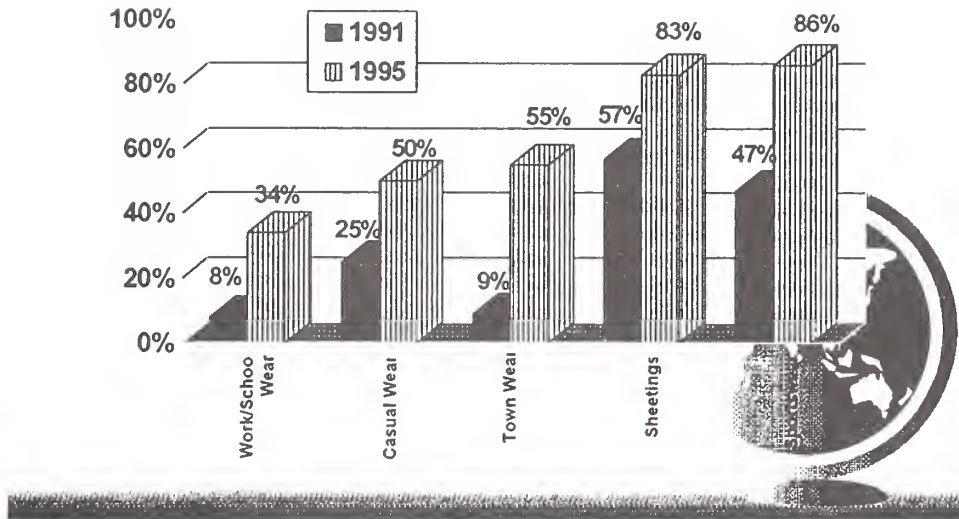
## Pakistan Cotton Exports (000's)



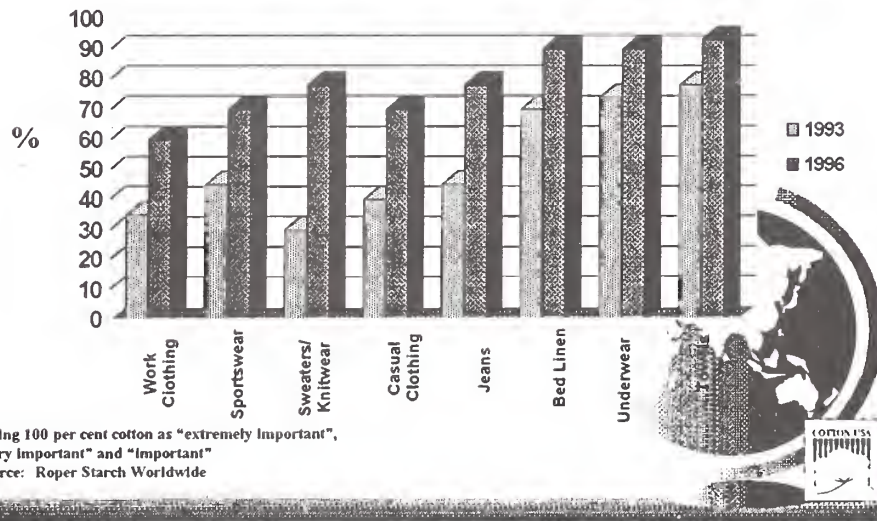
## Top Ten Countries in Cotton Production (000's)



# Importance of 100% Cotton Content for Consumer Textile Purchasing \*\*Korea\*\*



## PURE COTTON'S PURCHASE IMPORTANCE EUROPE 1996 vs 1993







# USMEF International Office Network

- 1976 Denver
- 1977 Tokyo
- 1980 Hamburg
- 1980 Middle East
- 1984 Singapore
- 1988 Hong Kong
- 1989 Taipei
- 1990 Mexico City
- 1991 Seoul
- 1992 Osaka
- 1993 Caribbean
- 1993 Russia & FSU
- 1994 Western Hemisphere
- 1995 China



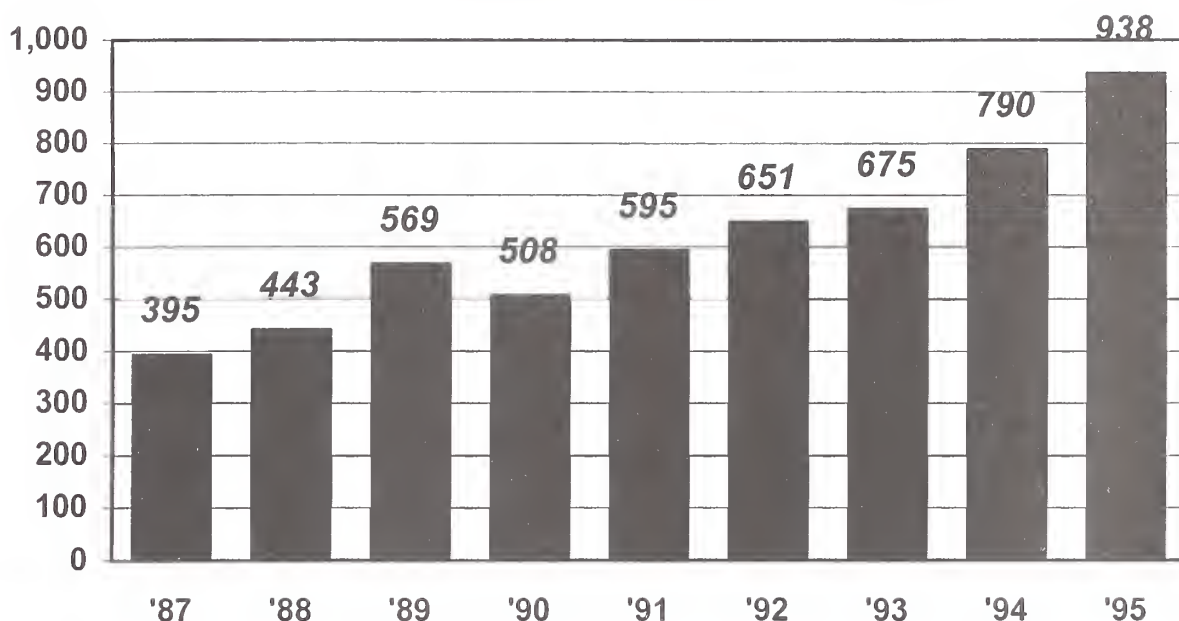
## USMEF Sectors

1. Beef Producing and Feeding
2. Pork Producing and Feeding
3. Lamb Producing and Feeding
4. Grains and Soybean Producing
5. Packing and Processing
6. Purveying and Trading
7. Farm Organizations
8. Agribusiness





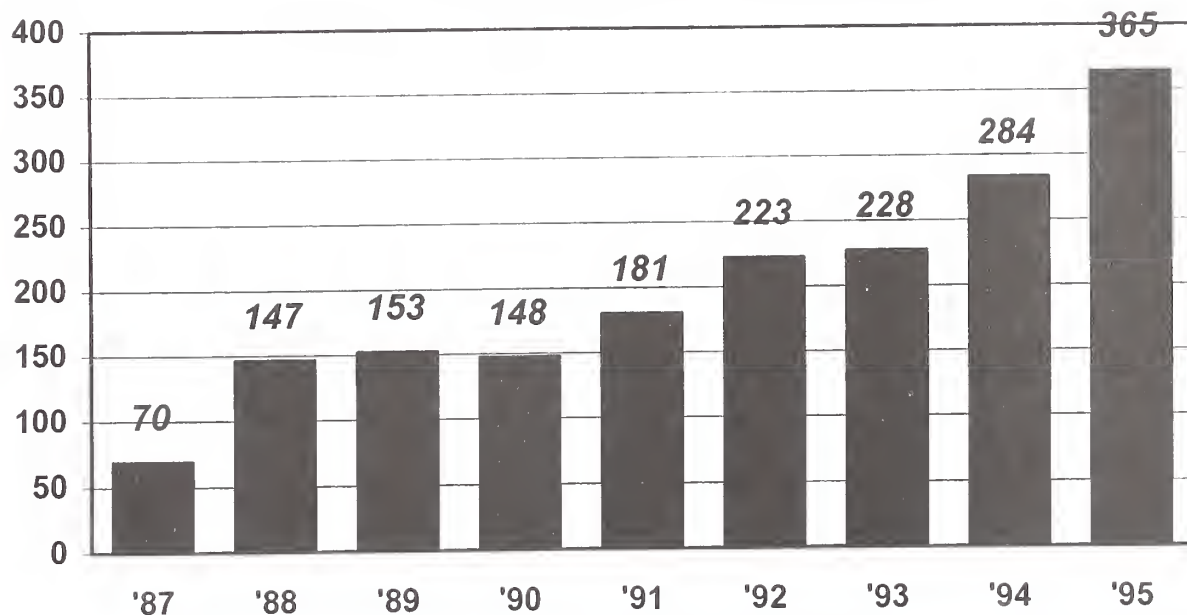
## U.S. Beef & Beef Variety Meats Exports (Thousand Metric Tons)



Source: USDA



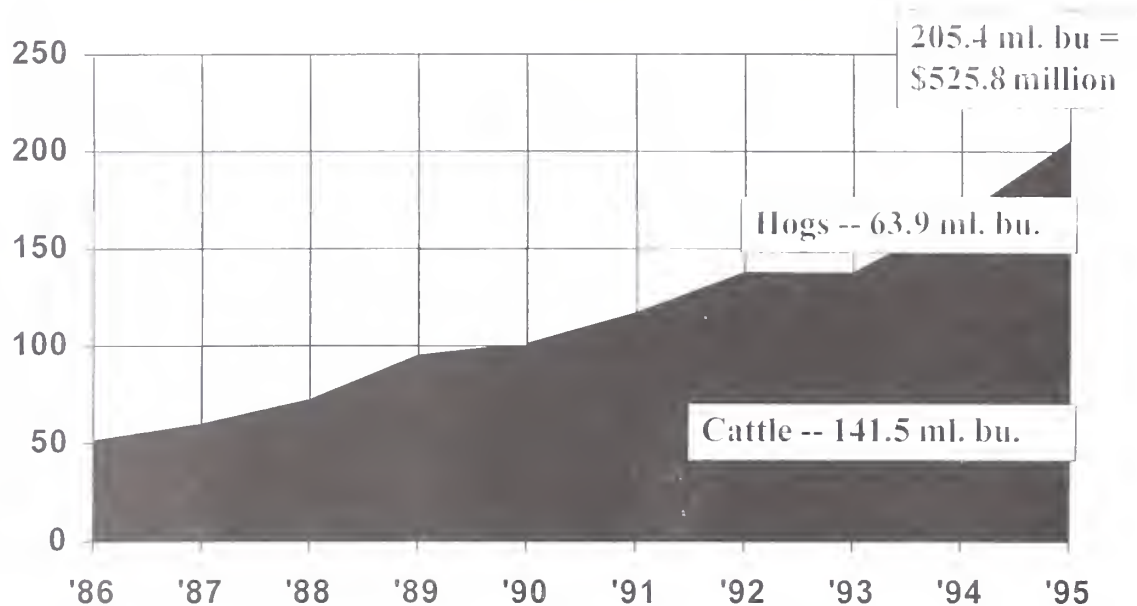
## U.S. Pork & Pork Variety Meats Exports (Thousand Metric Tons)



Source: USDA



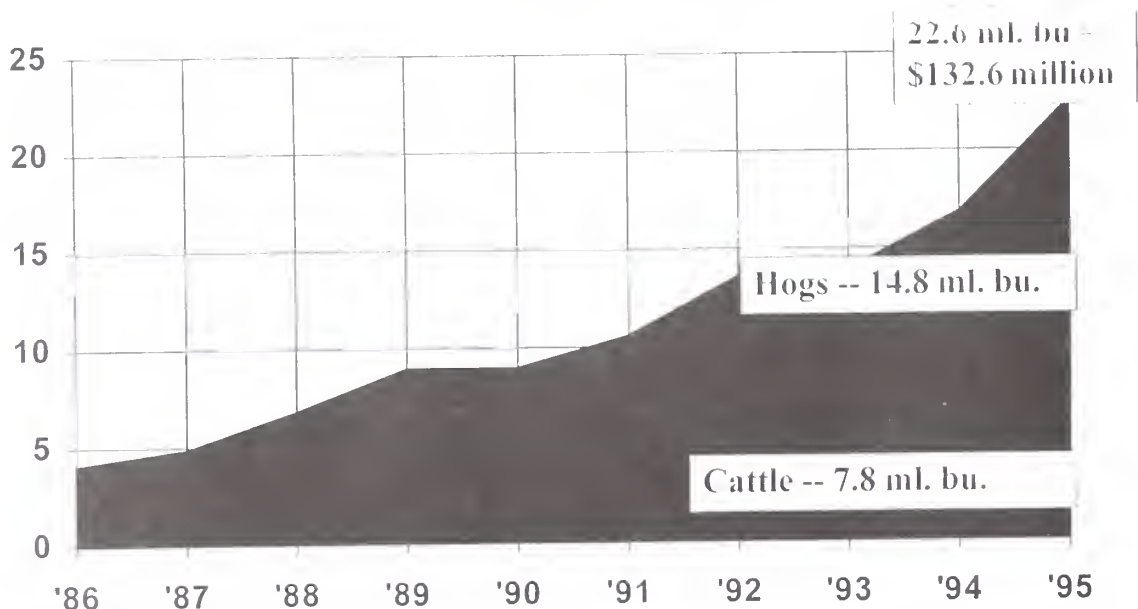
## U.S. Feedgrain Exported Through U.S. Beef and Pork Exports (Million Bushels)



Source: CF Resources



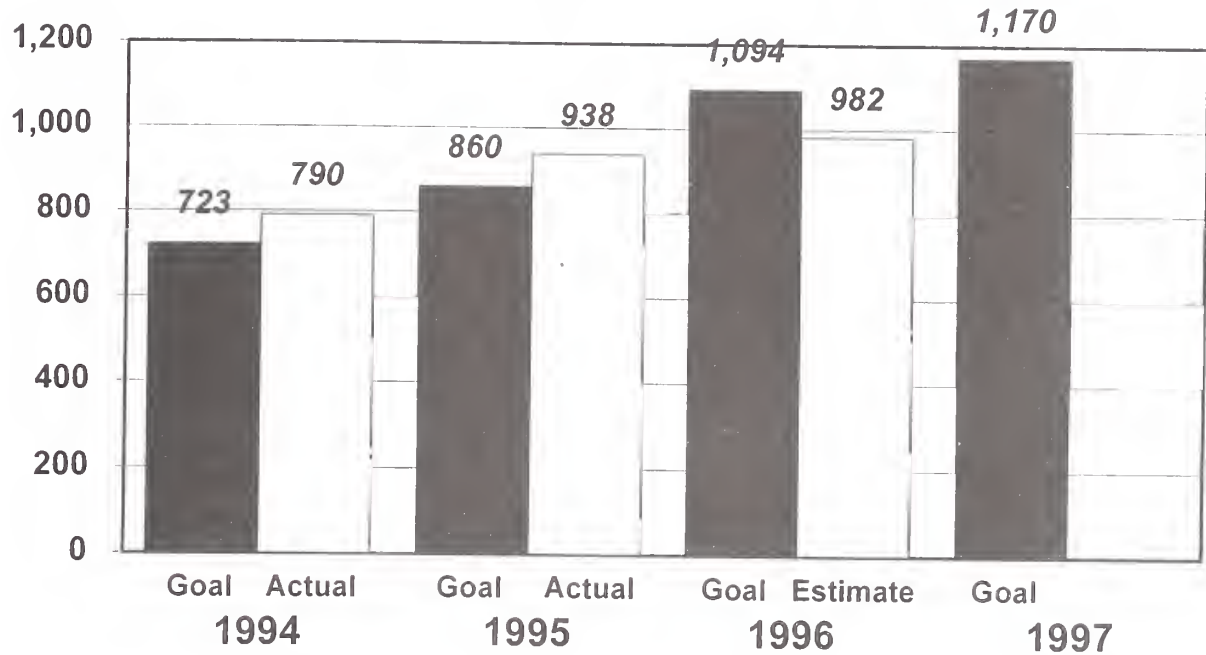
## U.S. Soybeans Exported Through U.S. Beef and Pork Exports (Million Bushels)



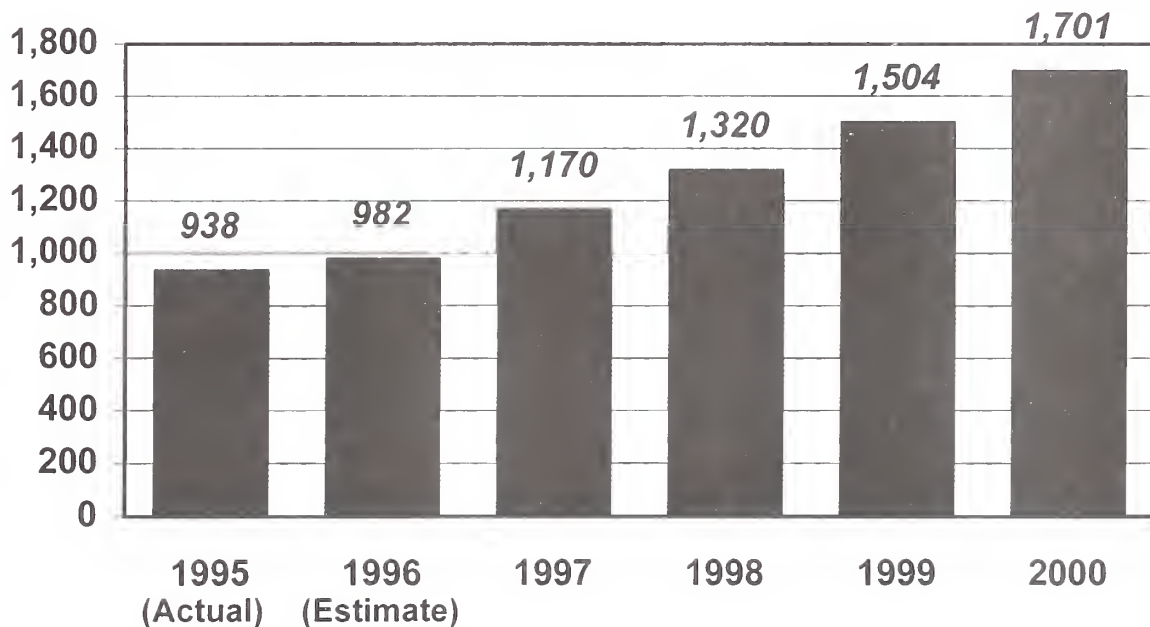
Source: CF Resources



## U.S. Beef & Beef Variety Meats Annual Goals vs. Actual Exports (Thousand Metric Tons)



## USMEF Export Goals Beef & Beef Variety Meats (Thousand Metric Tons)





## USMEF Export Goals Beef & Beef Variety Meats (Thousand Metric Tons)

<i>Country</i>	<i>'96</i>	<i>'97</i>	<i>'98</i>	<i>'99</i>	<i>'00</i>	<i>Increase '96 - '00</i>
Japan	545	616	678	734	791	45%
Canada	108	115	120	122	125	16%
Mexico	84	100	126	167	200	138%
Korea	80	100	120	150	190	138%
Russia	50	67	80	100	130	160%
Others	115	172	196	231	265	130%
<b>TOTAL</b>	<b>982</b>	<b>1,170</b>	<b>1,320</b>	<b>1,504</b>	<b>1,701</b>	<b>73%</b>



## JAPAN Beef & Beef Variety Meats

<i>1996</i>	<i>1997</i>	<i>Annual Increase</i>
<i>545,000 m t</i>	<i>616,000 m t</i>	<i>13%</i>

- ➔ No Adverse Food Safety Issues Arise
- ➔ U.S. Price Remains Stable
- ➔ Yen Remains Stable
- ➔ New Markets Within a Market Are Identified



## CANADA

### Beef & Beef Variety Meats

<i>1996</i>	<i>1997</i>	<i>Annual Increase</i>
<i>108,000 m t</i>	<i>115,000 m t</i>	<i>6%</i>

- ➔ Favorable Exchange Rates
- ➔ Competitive Geographic Advantages
- ➔ NAFTA Utilization



## MEXICO

### Beef & Beef Variety Meats

<i>1996</i>	<i>1997</i>	<i>Annual Increase</i>
<i>84,000 m t</i>	<i>100,000 m t</i>	<i>19%</i>

- ➔ Peso Stability
- ➔ U.S. Price Remains Stable
- ➔ Economic Growth to Strengthen Middle Class
- ➔ NAFTA Utilization
- ➔ International Competition Does Not Increase



## KOREA

### Beef & Beef Variety Meats

<i>1996</i>	<i>1997</i>	<i>Annual Increase</i>
<i>80,000 m t</i>	<i>100,000 m t</i>	<i>25%</i>

- ➔ No Adverse Food Safety Issues Arise
- ➔ SBS System Awards Quota to Sectors With Most Potential
- ➔ U.S. Introduces New Cuts
- ➔ U.S. Price Remains Stable



## RUSSIA

### Beef & Beef Variety Meats

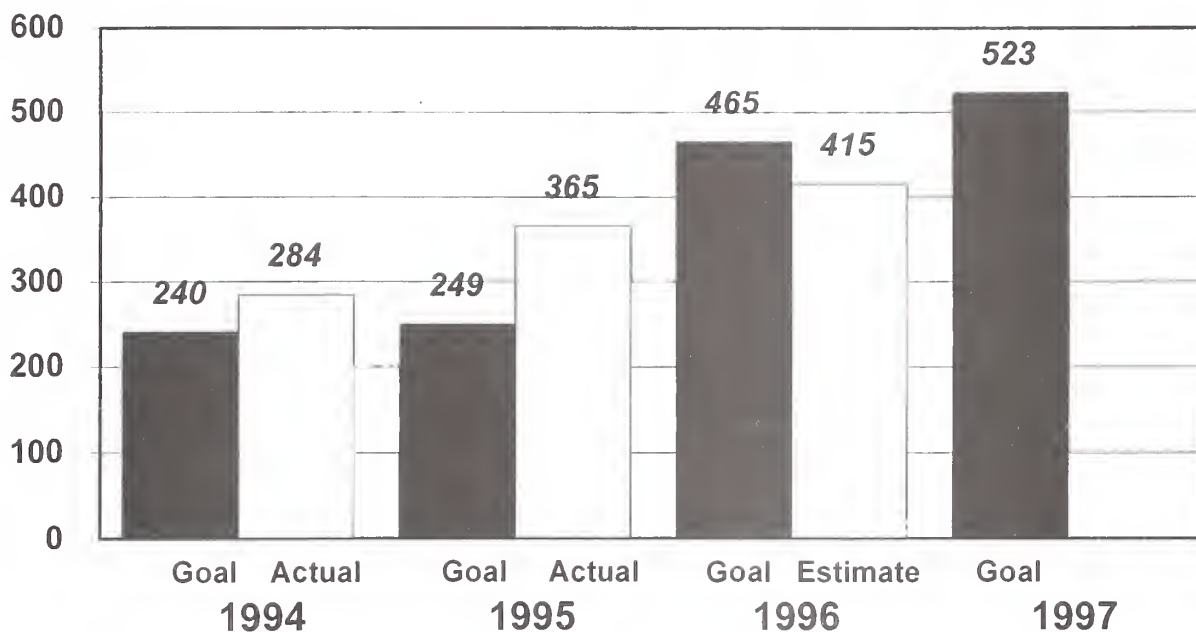
<i>1996</i>	<i>1997</i>	<i>Annual Increase</i>
<i>50,000 m t</i>	<i>67,000 m t</i>	<i>34%</i>

- ➔ U.S. Competitive Pricing
- ➔ Expand Market Beyond Livers
- ➔ Distribution/Transportation Issues

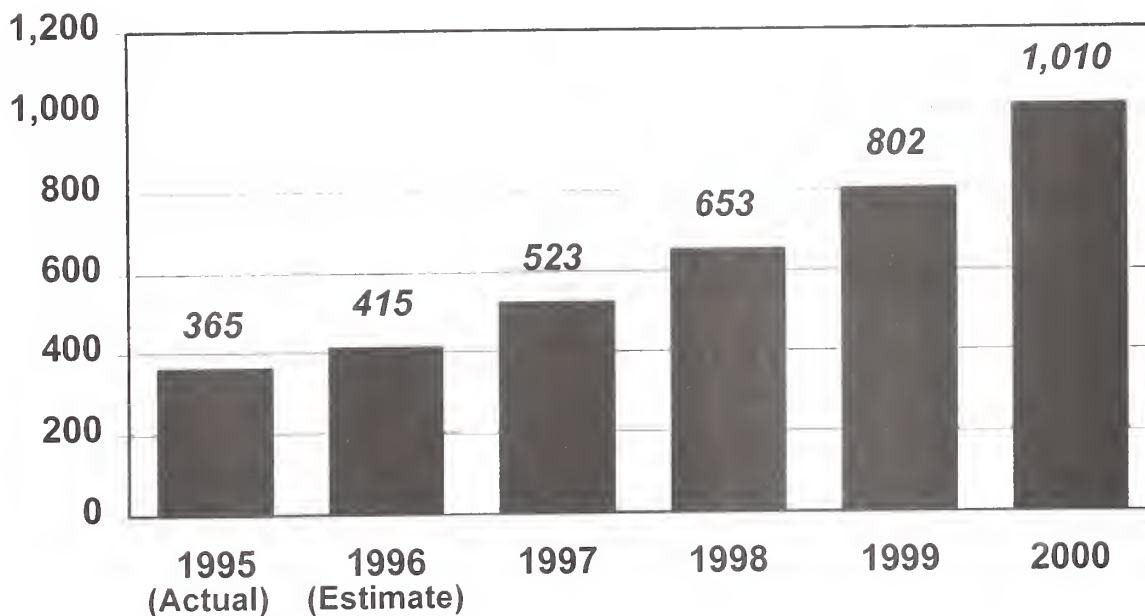




## U.S. Pork & Pork Variety Meats Annual Goals vs. Actual Exports (Thousand Metric Tons)



## USMEF Export Goals Pork & Pork Variety Meats (Thousand Metric Tons)





# USMEF Export Goals Pork & Pork Variety Meats (Thousand Metric Tons)

<i>Country</i>	<i>'96</i>	<i>'97</i>	<i>'98</i>	<i>'99</i>	<i>'00</i>	<i>Increase '96 - '00</i>
Japan	195	224	250	277	318	63%
Mexico	79	92	119	153	197	149%
HK/PRC	32	50	90	130	200	525%
Russia	25	38	50	57	60	140%
Korea	10	15	30	48	70	600%
Others	74	104	114	137	165	123%
<b>TOTAL</b>	<b>415</b>	<b>523</b>	<b>653</b>	<b>802</b>	<b>1,010</b>	<b>143%</b>



## JAPAN Pork & Pork Variety Meats

<i>1996</i>	<i>1997</i>	<i>Annual Increase</i>
<i>195,000 m t</i>	<i>224,000 m t</i>	<i>15%</i>

- ➔ No Adverse Food Safety Issues Arise
- ➔ NPPC Resolves Trade Issues
- ➔ New Realities of the Market Are Addressed
- ➔ No Major Changes in U.S. Price



## MEXICO

### Pork & Pork Variety Meats

<i>1996</i>	<i>1997</i>	<i>Annual Increase</i>
<i>79,000 m t</i>	<i>92,000 m t</i>	<i>16%</i>

- ➔ Peso Stability
- ➔ U.S. Price Remains Stable
- ➔ Economic Growth to Strengthen Middle Class
- ➔ NAFTA Utilization
- ➔ International Competition Does Not Increase



## HONG KONG/CHINA

### Pork & Pork Variety Meats

<i>1996</i>	<i>1997</i>	<i>Annual Increase</i>
<i>32,000 m t</i>	<i>50,000 m t</i>	<i>56%</i>

- ➔ China Pork Liberalization
- ➔ Transportation/Distribution Issues
- ➔ Strategic Partnering
- ➔ Political and Economic Stability



## RUSSIA

### Pork & Pork Variety Meats

<i>1996</i>	<i>1997</i>	<i>Annual Increase</i>
<i>25,000 m t</i>	<i>38,000 m t</i>	<i>52%</i>

- ➔ Trade Issues Are Resolved
- ➔ Transportation/Distribution Issues
- ➔ U.S. Price Remains Stable
- ➔ International Competition Does Not Intensify



## KOREA

### Pork & Pork Variety Meats

<i>1996</i>	<i>1997</i>	<i>Annual Increase</i>
<i>10,000 m t</i>	<i>15,000 m t</i>	<i>50%</i>

- ➔ No Adverse Food Safety Issues Arise
- ➔ Market Liberalization
- ➔ Transparency of Trade Regime
- ➔ U.S. Packers Adapt to New Market Realities

# *The Role of Market Information in a Changing Market Structure*

Wayne D. Purcell

Professor and Director, Research Institute on  
Livestock Pricing, Virginia Tech

## **Introduction**

The U.S. Department of Agriculture (USDA) has long been involved in collecting and disseminating market information. In the 1990s, some of the state partners in a federal-state joint market news activity have dropped out or reduced their financial support and participation. The need for continued USDA involvement is being questioned, and some critics argue that private firms could and would take over this function. After all, it is argued, communication is easier than ever. We are in an era where everything is presumably available by internet. Private firms would provide information on a "user fee" basis. The users who benefit directly, not the general taxpayer, would pay for the service. All this leads to an inevitable question: Why is there public involvement in market news collection and dissemination?

Historically, there has always been the notion that public involvement in market news activities is justified because there is a *public good* dimension to those activities. This means that the public receives benefits from market news activities that would not be present if public efforts were not involved. This reason for public involvement was more prevalent in the early discussions than it is today, but it is still very important.

A second, and perhaps even more important, reason for public involvement emerges from the relationship between *the adequacy of the market information base, the effectiveness of price discovery, and the organizational structure of the marketplace*. In the late 1990s, market structure is on everybody's mind. Consolidation and concentration are occurring in virtually every commodity sector, and most producers don't like the trend. But not many of those concerned about the trend recognize the relationship between price discovery and structure. *Market failure due to ineffective price discovery processes prompts moves to concentrated markets and non-price means of coordination*.

This latter issue will be pursued in this brief paper. I believe an important and largely irreversible change in market structure is occurring in substantial part because the traditional price-based exchange systems are failing to achieve inter-level coordination of action in our production-marketing systems. Though important in all food and fiber sectors, in no sector is this issue more important and more visible than the livestock/meat sectors. In pursuing this issue and exploring the importance of adequate market information, my working hypothesis is that the livestock and meat markets will continue to consolidate and move to non-price means of coordination. Further, this trend will occur at least partly because of market failure due to price discovery processes that are less effective and efficient than they could be. One reason price discovery is and will be less effective is the lack of a public willingness to support the gathering and disseminating of important market information.



## The Market Structure Connection

The conventional marketing systems for food and fiber products have been open market exchange systems. Prices and pricing signals have been the coordinating mechanism and have, presumably, been the agent of change to ensure that what is produced is consistent with what is in demand at the consumer level. To be effective in this important role, the prices evolving from auctions and one-on-one direct negotiations need to be based on good information. Grades must effectively categorize important value-related product attributes at the consumer level, and the product attributes identified by the grades must be brought into the pricing process. Price signals can be attached to product attributes of importance only if they are identified. Further, both buyer and seller must be negotiating from a common understanding of what constitutes value. And very importantly, the seller--especially the small producer of agricultural products--must have something approaching an equal knowledge of the underlying supply-demand forces that determine the "true" underlying but unobservable market-clearing price. If these conditions are not met, then the price signals are not sharp, the communication effectiveness of the entire system declines, and we face the possibility of what Williamson and others started to identify as early as the late 1960s and early 1970s as a "failure" of the open market price-based systems.

The efforts by Williamson and by Purcell in the 1970s continued a theme, a warning, that other agricultural economists had raised in the 1950s and 1960s: *If the price-based open exchange systems do not improve in terms of inter-level coordination of activity in our production-marketing systems, they will eventually be replaced by contracts or vertical integration which allow the needed inter-level coordination to be ensured by management directives.* Mighell and Jones, in a pioneering effort, had laid out in the 1960s ways to achieve vertical coordination. Included in their matrix were some of the non-price ways (contracts, vertical integration) of achieving coordination that we are seeing today. Purcell and Dunn and Rathwell and Purcell found evidence of goal conflicts and operational inconsistencies that blocked inter-level coordination in the beef systems of the 1970s. Williams and Farris documented efficiencies and lower cost production in integrated production systems compared to systems where each level of activity involved a purchase and later sale in the open market.

In the late 1990s, there is an abundance of evidence to suggest the long-standing warnings are coming true--that price-based markets that are not effective in achieving inter-level coordination across technically related economic functions will be replaced by contractual arrangements and integrated structures. Alchian and Demsetz had put this issue forward in an interesting way over 20 years ago. They discussed types of cooperative action and organizations and advanced the idea *that a firm, by bringing a number of the technically related inputs and functions under its control, starts to compete with the conventional markets. The firm becomes the coordinating mechanism, and it ensures a level of coordination the price mechanism may be unable to achieve in the presence of limited information and within existing market structures and related profit-center behavior.* The market structure tends to change to earn those benefits of coordination. That is precisely what the pork processors of 1997 are doing as they control genetics, reduce quality variability, schedule slaughter from owned or contracted production programs, and bring on-line low-cost operations which can accomplish an alignment between what is being produced and what modern consumers demand.

In cattle, it is the controversial *captive supplies* that would appear to have developed because of the long-predicted failure of the open market price system. It is true that these approaches to procurement came during the time of packer concentration, but one has to reflect on the *why* of the changes. Some would argue packers use captive supply cattle to drive prices down, but the research evidence (Ward *et al.*) shows no major price impact. It may be that the need to keep costs under control and to achieve inter-level coordination was the motivating force.

Paul, among others, argued many years ago that certain production processes will be combined under a single management (or combined by contract) because of the joint nature of the production process and the related need for joint decision making. The problem a firm faces is one of finding the optimum vertical or inter-level enterprise combination for the firm. Paul identified technological change and the desire for risk-sharing arrangements as factors redefining the vertical scope of firm activity and how firms work with others. The vertical disintegration of the traditional corn-hog, farrow-to-finish farm combination into separate farrowing and finishing functions is a good example. Changing technology resulted in a new vertical enterprise combination and a new industry structure. That process has now taken a turn toward very close working relationships between processors and a few mega-sized hog finishing operations, and industry structure is changing rapidly.

Paul recognized that changing the vertical organization of the production-marketing system may result in new patterns of risk distribution. He emphasized that as the degree of economic specialization changes, new risk-sharing arrangements evolve. A firm might choose to integrate vertically with an adjacent stage even if costs are not reduced so long as the variability of costs and thus rate of return variability was reduced. In fed cattle, packers have said in public interviews that contracting cattle *does* reduce their costs. *There are clearly powerful reasons to move to non-price means of coordinating the technically related stages in the livestock-meat production and marketing system if the traditional price system fails to achieve that coordination.* The traditional price system has failed when price discovery is ineffective, when there is no pricing to value, and when price incentives do not prompt consistent quality and/or the needed regular flow of hogs or cattle into a processing facility.

There is, then, a possibly compelling reason for public involvement in information and outlook, a reason that has not received enough attention. *If society values an atomistic structure in production agriculture made up of many independent producers, then there is reason to seek to improve the performance and effectiveness of the pricing mechanism by improving the information available to buyers and sellers.* That could mean, for example, aggressively reporting the pricing of fed cattle and hogs on a carcass evaluation basis to eliminate the uncertainty that still characterizes liveweight purchases, especially in cattle. Clearly, grades would have to be effective. There could be no significant value differences within grade tied to tenderness or other important determinants of palatability and consumer satisfaction. Critics are calling for an abandonment of public beef grades in early 1997 precisely because there *are* consumer-important value variations within current grades. It *could* mean an even more pervasive and more sophisticated system of market news than now exists. But one can argue investments in market news are worth it because our conventional market systems, which we have valued so highly in other policy arenas, such as rural development and in our farm programs, are clearly at risk.

The critic might again object to all this and argue that the private sector will provide the needed information. Gorham argued some years back that private services tend to "fill in the gaps" rather than compete with USDA and other public sources. He is probably still right today. The need for information might have to reach crisis proportions before the for-profit private sector would overcome all

the discounting for uncertainty and make investments. Even then, a "profit wedge" is driven into the process and would tend to mean private firms would offer less information than do public agencies.<sup>1</sup> And before the crisis swells to proportions such that private firms *do* fill in, it may well be that the large firms in our increasingly concentrated markets become the "market" and eliminate reliance on prices--which is, to repeat, exactly what is happening in pork today. *It does in fact appear that there is a compelling reason for the public to ensure that quality information is available to buyers and sellers in our price-based exchange systems if we value those systems and value the viability of the independent entrepreneurial producers who have long been the hallmarks of those systems.*

In a recent and special research effort specifically designed to estimate the impact of market information on price discovery for fed cattle, Anderson *et al.*, found (1) fed cattle prices became more variable as access to market information was decreased in a controlled experiment, (2) the use of contract (captive supply) arrangements between cattle feeders and packers increased when market information was withdrawn, (3) there was more reliance on cost and break-even information when information on markets and market prices was withdrawn, and (4) there was more tendency for slaughter weights to vary from the level that was most cost effective for the entire sector. There are, based on this important work, clearly negative implications to social well-being from the withdrawal of market information. The increase in variability of fed cattle prices means added risk exposure, a risk that must be paid for by someone. Research shows that when exposure to risk increases, system participants (especially processors) will have to extract a larger margin for their services if they are to stay in business. The result in the cattle sector will be lower fed cattle prices in the short run and reduced supplies of beef, higher prices to consumers, a smaller beef sector in the long run, and pressures to move to non-price means of coordination.

### Looking Ahead

The discussions about public involvement in information gathering and dissemination will continue as we move toward the year 2000, and they will intensify. The criticisms of recent months and years will not disappear. We are caught up in an era of change. It behooves us, then, to try to focus attention on the truly important issues and to move the dialogue about policy formation into the arenas where the public interest is or should be most apparent.

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<sup>1</sup> Let

- MC = marginal cost of collecting and disseminating market information,
- MB = marginal benefit of information to decision makers, and
- $\Pi$  = profit needs of private firms to make investments in market new activities.

The marginal value of each additional bit of market information declines consistent with the laws of diminishing marginal returns. To society, more information is worth an added public dollar so long as the marginal benefit to society, MB\*, exceeds its MC. Thus, information would be collected and disseminated in accordance with the expression:

Collect so long as  $MB^* \geq MC$ .

But for the private firm, (if we assume  $MB \equiv MB^*$ ), the expression is

Collect so long as  $MB \geq MC + \Pi$ .

Thus, a "profit wedge" is driven into the process and less information would be collected and disseminated.



It will not be easy. We need a broad and analytical treatment of an area of activity that has not been, historically, conducive to breadth and analytical rigor. In the collection and dissemination of economic information, the public involvement spans the land grant universities, state agencies, and many agencies within the bounds of the U.S. Department of Agriculture. It is, then, not difficult to see why actions and policies are often fragmented and micro in orientation when a broader, more nearly macro, and analytical approach that ties all the pieces together is what is needed. And it is very difficult to conduct research in this general area that generates empirical measures of the private and/or public benefits to market information.

Having recognized it will not be easy, it is imperative that we get it done. The public interest in the late 1990s goes far beyond the historical thrusts of getting information to the small producer to level the playing field and to try to ensure producers will be protected by at least a modicum of competition between and across the increasingly large buyers. Those were and still are admirable goals and we should not ignore them. But in the late 1990s, the public information efforts are being carried forward in a significantly different operating environment. Markets for food and fiber products are concentrated to an extent without historical parallel. There are huge and powerful players, especially at the processing level, who are becoming increasingly impatient with perceived inadequacies in our traditional exchange-oriented and price-driven marketing systems. They are facing powerful cost and profit-related economic reasons to act. The price-based systems will be replaced as coordinating mechanisms if those systems do not become more effective.

There are numerous and clear signals in our farm and rural development policies that the public is interested in perpetuating an economic structure characterized by a number of aggressive, innovative, and competitive independent entrepreneurs. That type of structure typically relies on transaction prices to move the food and fiber product from the producer as a profit center to the processor as a separate (but technically related) profit center, and on up toward the final consumer. If the large processor in our increasingly concentrated livestock markets gets the raw material inputs it needs from independent producers when needed and at a consistent quality, the incentive to integrate vertically into production and/or control production by closely specified contractual arrangements is diminished. It is reduced to the incentives associated with being more efficient in production, and there are numerous indicators that an independent producer who is large enough to spread fixed costs over at least modest production levels and can put together truckload lots of consistent, high quality hogs or fed cattle, can compete in production efficiency. *It will be the lack of inter-level coordination--the wrong quality, high levels of quality variation, poor or unscheduled timing in the quantity flow into the plants--that will drive the processor towards coordination by non-price means and brings the demise of the traditional price-based systems.* It will be ineffective price discovery, not an overwhelming cost advantage, that will prompt processors to move to non-price means of coordination.

It is essentially a tautology that pricing, price discovery, pricing accuracy, and pricing efficiency are tied closely to the available information base. Price cannot be effective as a coordinating mechanism if the information on which it is based is inaccurate, inappropriate, or comes up short along important dimensions. A pork processor who is fully responding to the fresh pork consumer market by offering a high quality cut of branded fresh pork that reduces preparation times in the kitchen must have the right hogs in terms of quality and timing if brand identification, promotion, and guarantees of satisfaction are to be extended. But if the livestock producer is to meet those needs, what the processor needs must be made clear during the pricing process. *All significant value-related dimensions of the product offering must be brought into the pricing process, and that pricing process must be reported in some depth and detail.*

The need, then, is for quality information along a broad continuum. Grades and product descriptors must be refined and highly specific. If there is still lots of value variation within #1-2 barrows and gilts weighing 230-250 lbs., we need (and we *are* getting) more refined grades, descriptors, and transaction terminology. If the intensity of current dialogue is any indication, the need is much more pressing in beef. *If there is in fact significant eating quality variation within the Choice grade, then it has to be broken out, categorized, and identified. Effective price discovery is impossible unless those consumer-important traits are identified and reported by market news disseminators. If these things are not done, there are powerful economic reasons (costs, quality assurances, inter-level coordination) for processors to bypass the pricing system and go to non-price means of coordination.*

If we have lacked the public will to make the investment needed when the traditional reasons for public involvement in market news were examined, perhaps the willingness will be there if we recognize that we are also setting the stage for the organizational structures we will see in the decades ahead. We clearly do care, as a collective public, how our markets are structured. And anyone who does not recognize that failures in our pricing mechanisms (traceable at least in part to inadequacies in our market and market-related information base) have contributed to the demise of our pricing systems in many sectors of our livestock economy has not been paying attention to the developments of the 1990s.

For many market-related reasons, then, we *must* have high quality information that is not fraught with error and is not presented in such a way that still allows for widely varying interpretation by users. Pricing to value must be accomplished. Risk associated with significant price volatility and uncertainty that can be traced to the lack of market information must be eliminated or reduced to tolerable levels. Whatever the distribution mechanism, these needs have to be met and we have to do what is necessary to ensure they are met. If there is no other overriding message in the literature, there is one that consistently points to a positive net value for public involvement to help ensure competitive prices and efficient economic activity. If that traditional and persistent message is not sufficient to prompt us to fix a system that appears to be broken along several dimensions, then I hope extending the reasons and the discussion to include helping to ensure the viability of pricing systems and a market structure we have valued as a society will prompt the needed actions and the needed commitment.

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**CONCENTRATION IN THE LIVESTOCK SECTOR  
A PRODUCER'S PERSPECTIVE**

*by*

**John Hardin, Jr.  
Member USDA Advisory Committee  
on Agricultural Concentration**

*The participants in every link of the beef, pork, and poultry chains are becoming fewer and larger. The economic forces driving these changes are similar to those that are bringing about increased concentration in the rest of our economy. The USDA Advisory Committee on Agricultural Concentration (the Committee) was assembled to review the impact of increasing concentration on U.S. agriculture, and to recommend new public policy in areas where the Committee felt change was needed.*

*The membership of the Committee included agricultural economists and representatives from the production, marketing, processing, and transportation sectors of the industries that were to be reviewed. Their political philosophies covered the entire spectrum of the agricultural policy rainbow. In spite of the diversity of the group, the committee did reach consensus on a number of broad policy recommendations and unanimously endorsed a policy to support and improve market information as a vital component of a competitive marketplace. The committee made a number of recommendations for the livestock industry in four areas; antitrust and regulation, a new disclosure policy, vertical linkages, and cooperatives/producer bargaining.*

*The committee found that major differences exist between the beef, pork, lamb, and poultry industries. The industries differ significantly with respect to their structure, marketing and pricing systems, biological capabilities and limitations, business practices, and current levels of industry cooperation, concentration, and coordination. There was recognition that blanket recommendations for one species could have serious, unintended consequences if applied to the entire meat industry.*

*U.S. agriculture is clearly in the midst of evolutionary change. Vertical integration is the predominate structure in some industries, and nearly all of the rest of agriculture is moving to much greater coordination throughout the production and marketing chain. The reasons for these changes are numerous. Two of them are: targeted production gives better quality control and greater responsiveness to consumer demands; and vertical coordination often results in lower costs and improved efficiency throughout the chain.*

*As the world economy becomes increasingly interdependent, large multinational companies have a significant competitive advantage in opening and expanding export markets. An increasing share of U.S. exports are value added commodities. In meat exports, our initial penetration into a commercial export market is often with our very highest quality meat products. The large meat packing firms have a choice: (1.) do they obtain the needed top quality cuts by sorting from the general production run; or (2.) do they ally themselves with producers that will provide animals that will meet the product quality and production standards their import customers demand. It is my contention that a growing number of meat exporters will choose the second option.*

*Some of the producers who testified before the committee felt that these trends were threatening their way of life, and that public policies should be developed to stop or reverse the momentum of change. I do not believe this is a likely outcome. My belief is that we should focus on the new reality of coordinated production and the issues that must be addressed if farmers and ranchers are to become partners rather than pawns in the U.S. food system.*

*The poultry industry is the most integrated in the meat sector. The committee heard divergent testimony as to the viability and fairness of grower contracts. In areas of the country where multiple processors were competing for contract growers there seemed to be satisfaction with economic returns to growers and the relationships between the integrators and the contract growers. In areas where a single processor was the only integrator available to growers, there tended to be much greater dissatisfaction on the part of the contract growers. Competition matters and a means to insure a balance of economic power is essential in areas where competitive forces are not in balance.*

*Producers should be able to bargain with first handlers as a group without fear of recrimination. At the same time, the processor or integrator should retain the right to deal individually with a grower who does not meet the performance standards of the production contract. The right of producers to organize under the Capper-Volstead Act must be preserved. The committee recommended that the Agricultural Fair Practices Act of 1967 be*

*amended to require handlers to engage in good faith negotiation with producer cooperatives and networks, and to purchase products from these entities without discrimination. As a growing share of agricultural production is controlled by production contracts, a proactive public policy in this area is vital to maintain the opportunity for good economic returns to the production sector.*

*While the pork industry is not as integrated as poultry, it appears to be following a similar path. Many producers hope that a model of networks and coordinated production will prove to be competitive with players in the industry that attempt full vertical integration. An important ingredient for individual producers will be transparency regarding marketing arrangement qualifications. Producers will need to know what they must do to qualify for participation in future marketing arrangements.*

*The capital requirements for the live animal production necessary to supply a modern pork slaughterhouse are very large compared to the poultry industry and will be an impediment to full integration. The challenge for independent growers will be to remain cost competitive and to provide large numbers of animals that produce cuts that are consistent in size and high quality. In addition a system to insure that the quality of the products offered to the consumer is constantly being upgraded will be a vital ingredient in competing with fully integrated producers.*

*The latest data I have from Grimes and Rhodes is that 71 percent of the hogs sold in 1994 were purchased on a carcass merit basis. Thirty-eight percent of all hogs purchased that year were through some form of formula pricing. Local data bases I have seen in my home state would indicate that producers combining carcass merit with formula pricing are receiving higher returns than other producers. Packers obviously have an interest in, and are willing to pay for uniform lots of high quality animals that are available for processing on a predictable schedule.*

*At some point in the future as the cash market for live hogs becomes thinner, formulas may be based upon downstream markets, thereby making accurate, timely data on wholesale and retail prices more critical to the farm pricing decision. Research describing the transition from spot markets to other pricing arrangements in other commodities may help target issues the pork industry should address. In addition, USDA/industry efforts to improve price reporting systems on the wholesale, sub-wholesale, and retail sectors will be vital to the transition to a new price discovery process.*

*The majority of the public testimony the committee heard covered concentration issues in the beef industry. Eighty-two percent of fed cattle are slaughtered by the four largest beef packing firms. The three hundred*



largest feed lots account for fifty-seven percent of the fed cattle sold. There was widespread distrust of the price discovery process. It was asserted that there have been times when most of a week's fed cattle trade happened in a thirty minute window. Many producers were concerned about captive supplies of packer controlled slaughter ready cattle. Many felt that packer ownership and the use of marketing agreements and forward contracts allowed beef packers to depress the prices offered for open market cattle. Other producers gave testimony that marketing agreements allowed them to enhance their selling price and that they used forward contracts to manage risk.

The intensity and emotion of some who presented testimony was a reflection of the reality that fed cattle prices where at a ten year cycle low and feed grain prices were soaring to all time highs. These two events dealt a double blow to feeder calf prices. Many who testified came from ranches that had few economic alternatives other than converting grass into meat protein. Cow-calf operators and the rural communities that depended on them were in a genuine crisis.

The committee made a number of recommendations that would increase the amount of market information available to the beef industry. Some of the proposals were:

1. Contract or formula pricing premiums and discounts, based on carcass merit should be captured and reported.
2. Require timely, accurate price reporting of all packer livestock transactions, including data on captive supply.
3. The development of a value matrix for cattle similar to the "Lean Value Direct Hog Trade" that AMS Market News makes available to the pork industry.
4. USDA should develop a standardized list premium or discount categories for carcass merit purchasing.
5. The committee asked for considerable increase in volume and specificity of market information available on the wholesale beef trade.
6. USDA should encourage the development of a close trimmed boxed beef futures contract as an additional means of price discovery.

The committee heard from some players in the industry who felt that the additional market information requested was excessive. I believe the requests are a reflection of industry concentration and the relatively low levels of coordination in the beef industry.

Information the committee received indicated that small price differentials are paid for quality differences in slaughter cattle. Beef representatives on the committee informed us that some custom feedlot operators attempt to negotiate the same selling price for all cattle sold from their feed yards to a packer in a given week. I believe that if these practices are widespread,



*they are detrimental to the long term interests of the beef industry. In our economy change happens through incentive, and steps need to be taken so that each sector of the beef industry has a clear economic incentive to improve quality.*

*It should be noted that the beef industry concentration and price determination studies furnished to the committee showed that cattle prices were within predictable ranges. The recent decision by Tyson Foods to exit beef and pork processing is instructive. According to published reports, the management of the company felt that it could get higher returns for its capital and management by focusing on poultry. This is evidence to me that these sectors of the beef and pork industries are competitive.*

*On the other hand, the recent price fixing convictions in the feed ingredient industry remind us of the need to be vigilant. The committee made a number of recommendations that advocated increased monitoring and enforcement of antitrust and regulatory policy. However, there was a recognition that in the current environment, antitrust actions have become much more complex and difficult.*

*Daniel I. Padburg, Ph.D., who served as chairman of the committee, suggested that we consider a "market based disclosure policy" as an alternative to the traditional methods of antitrust enforcement. The committee supported inclusion of this proposal in the report. Many of the committee recommendations for more detailed market information would facilitate such a policy.*

*I quote from the report, "We conclude that antitrust policy would be more positively and effectively enforced if anticompetitive practices and behavior were more transparent and visible. Scarce resources and opportunities for productive government-business relationships would not be wasted in investigations that eventually wither for lack of evidence--or worse, because they were unjustifiable in origin... A disclosure policy can provide a basis for harmonious and productive interactions between the food industry and farmers as well as consumers... Finally, and importantly, disclosure makes the unfair use of market power against farmers more visible, easier to observe, and therefore, more effectively and quickly corrected."*

*I hope this portion of the committee report is given serious discussion. There is a strong sense that the old ways of regulating business practices are incompatible with responsible oversight of the new food system in the United States.*

## **FARMERS' INFORMATION NEEDS IN AN INTEGRATED MARKETPLACE**

Ian M. Sheldon  
Associate Professor  
The Ohio State University

A striking feature of structural change in the food system over the past forty years has been the change in the way in which agricultural producers and processors are vertically coordinated. Traditionally, coordination has occurred in open markets, but now there is a trend in many sectors away from open market transactions to coordination through either some form of contracting between producers and processors or integration where the two stages are combined within a single firm. In the case of broilers, about 90 percent of production occurs under contract, while in turkeys, 60 percent of production occurs under contract, and 28 percent under vertical integration. Other markets where contracting/integration are important include eggs, fruits, vegetables and sugar beets. More recently, hog production has exhibited a trend towards contracting, and many observers expect this to continue.

Various reasons have been put forward for increased integration in the agricultural sector. Most commonly, it is argued that closer vertical coordination has been driven by the requirements of processors for more precisely defined product specifications to meet changing consumer demands which have, in turn, been supported by changes in the technology of production. Whatever the causes of integration in agriculture, it raises an important question as to what type of information government can supply to a marketing system that is increasingly characterized by contracting and vertical integration.

### **Orthodox Arguments for the Supply of Public Information**

The existing public supply of information to the food and agricultural sector can be divided into two types, current price information and commodity outlook information. The underlying rationale for government supply of both these types of information is the notion that there will be an undersupply of information from the private sector, i.e. information is what economists call a public good.

Public price reporting has generally been aimed at reporting spot market prices of commodities which still retain their identity, and, in the case of commodities where there is farmer/processor integration, prices are reported at the first sale of the processed product, e.g. processed broilers and turkeys.

Public price reporting had its roots in concerns over the possibility that farmers were being exploited by processors and other traders of agricultural commodities, but has subsequently been justified on the grounds that it aids economic efficiency in the food marketing system. In particular, it is argued that price reports provide the benefits of a central market without the need for all market participants and products to be in a single location. In addition, by establishing product value, exchange is facilitated.

In the case of commodity outlook information, the basic objective has been to supply forecasts of future prices and quantities, given decision makers are operating in an environment of uncertainty about these variables. The public supply of outlook information to agriculture has begun to be questioned in recent years.

To some extent the public good argument has been weakened because of the growth in the supply of information from the private sector. In addition, many economists have suggested that if economic agents such as farmers utilize available information optimally and do not make systematic forecast errors, then resource allocation cannot be improved through the supply of public information on, say, future market prices. This argument, however, assumes that information is costless and that economic agents learn instantaneously from their forecast errors. Therefore, the public supply of information is still a means of aiding resource allocation.

## **Supply of Public Information and Contracting**

### *Prices*

In an environment of increased contracting, do these arguments for the public supply of information make sense? Where there are hybrid markets consisting of spot markets and contracting, the traditional arguments for information supply still hold. As contracting and vertical integration increase, however, the decline in the use of spot markets means that either publicly reported spot prices disappear altogether or they reflect such thinly traded markets that they are no longer of any real economic benefit.

On the face of it this seems to suggest a potential economic loss. In particular, producers and contractors have no basis on which to conduct negotiations over compensation, and related to this there is the possibility producers will be subject to opportunistic behavior by the contractor. However, the forces pushing markets towards contracting, and the logic of contracting itself suggest that such a loss will not necessarily occur.

Many observers argue that traditional price signals have become inadequate in terms of transmitting consumer demands for product characteristics such as low fat content and food safety, hence the shift to contracting by processors. Contracts allow the processor to provide farmers with much more precise product specifications. While the contractor has some

control over this as they often supply key inputs and managerial advice, they must still provide producers with the correct economic incentives to produce the right type of product.

### *Risk*

When farmers operate in open markets, they face two sources of risk: production risk due to factors such as climate and disease, and price risk which affects the variability of their income. If farmers are averse to bearing such risk, then outlook information that reduces the degree of uncertainty will aid both their production decisions and increase their economic well-being.

A key characteristic of contracting is that much of this risk is transferred from the producer to the contractor. For example, in hog production, we typically observe contracts where the producer receives a set payment per finished pig plus various performance incentives. The set payment provides the hog producer with some insurance against production and price risk, i.e. they receive this payment regardless both of how well they perform on the contract, and the price of finished hogs received by the contractor. The performance incentives mean that the hog producer is not fully insured against production and price risks. The reason for this is that, because it is costly for a contractor to fully monitor the effort of a hog producer, the producer must be provided with some incentive to perform well, and, as a result, the hog producer will bear some of the risk.

Contracting, therefore, does provide a degree of insurance to producers against production risk, and, hence, reduces the need for the public supply of outlook information. For example, in a comparison of independent production and contracting, researchers at North Carolina State University have calculated that broiler price risk is the major component of risk that an independent grower would face, and this, along with production risk, is shifted to the contractor under the typical broiler contract (Knoeber and Thurman).

Nevertheless, while producers benefit from a reduction in short-term production risk, and they are insured against price risk, they are exposed to long-run capital risk due to the fact that contractors often require that they supply necessary production capital, e.g. broiler and hog houses. This suggests that there would be economic value to information on the long-run prospects for demand for the contractor's product, and, hence, the rate-of-return to capital.

As there are usually only a few large contractors and many smaller producers, producers are uncertain about the nature of contracts on offer as they are privately negotiated. Therefore, producers may be concerned about selecting the firm for whom they will contract. The producer may require information concerning the types of contract on offer, the terms of those contracts, the contractor's financial viability, and their commitment to the contracting arrangement. Information on such factors could be supplied by either a public agency or



private sources, although there is a question concerning the extent to which public agencies should/can be involved in monitoring what are private contracts.

From the contractor's standpoint, while input supply risk is reduced through contracting, they are exposed to additional risk through the shifting to them of some of the producer's risk, and also downstream price risk. This may not matter if the contractor can insure against such risk, e.g. in the broiler industry, in excess of 50 percent of production is accounted for by publicly-traded firms, whose stockholders can minimize risk through holding diversified portfolios. Nevertheless, there may be a premium on ensuring the availability of information on future consumer needs for the processed product and detailed information on retail prices.

In summary, traditional supplies of public information to agriculture may no longer be relevant where there is increased reliance on contracting. This follows from the fact that contracts provide some insurance against risk to producers, and the contractor, in meeting the diverse demands of consumers, has to provide the correct economic incentives to producers. However, as farmers' information requirements change with the increase in contracting, there may be a need for the public supply of information on a wide range of aspects:

- the types and terms of contracts available
- the financial viability of the contractor(s)
- the long-run capital risks of contracting
- the balance sheet effects of contracting
- the financing arrangements available
- the performance of contracts
- downstream market information

This type of information would aid farmers in their capital investment decisions as they consider either entering contractual arrangements or exiting the industry if they are already small-scale independent producers. In addition, such information may aid in reducing price uncertainty facing contractors, however, it is moot whether this should be publicly supplied to large corporations well able to bear risk.





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# OVERCOMING CHALLENGES IN HIGH-VALUE PRODUCT MARKETS

FEBRUARY 25, 1997

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*CHARTING A NEW COURSE*



U.S. AGRICULTURAL FOOD EXPORTS

THE FUTURE IS IN:

HIGH VALUE PRODUCTS

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PERCEIVED AROUND THE WORLD  
AS HIGH QUALITY



## AN EXAMPLE OF THE INDUSTRY'S PERSPECTIVE:

Achieve Growth in Exporting  
High-Value Products:

What Are the Challenges

How Do We Overcome Them

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CHARTING A NEW COURSE



ACHIEVE GROWTH:



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## THE CHALLENGES:

- Geography
- Product
- Implementation
- Financial

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### CHARTING A NEW COURSE



## FIRST CHALLENGE:

### GEOGRAPHIC POTENTIAL

Determine the country/market:

1. Per capita income/Urbanization
2. Country growth/GNP
3. Country risk/Political stability
4. Market size
5. Consumption per capita
6. Market share
7. Tariff and Non-Tariff trade barriers



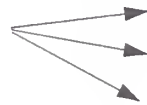
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## SECOND CHALLENGE:

### THE PRODUCT

#### 1. Determine the right products for the right markets

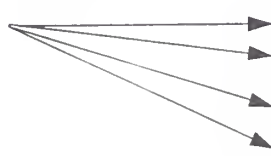
Market Research



consumer need/customization  
point of difference/uniqueness  
brand power

#### 2. Bring the product to the market

Compliance:



import regulations  
product registration  
ingredients  
labeling

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## THIRD CHALLENGE:

### IMPLEMENTATION

- Determine your partner: Distributor/Joint Venture
- Be in the proper distribution channels
- Build brand power with:
  - product news
  - advertising
  - sampling

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## FOURTH CHALLENGE:

### FINANCIAL

- Determine the right price for the market
- Be profitable (short term/long term)

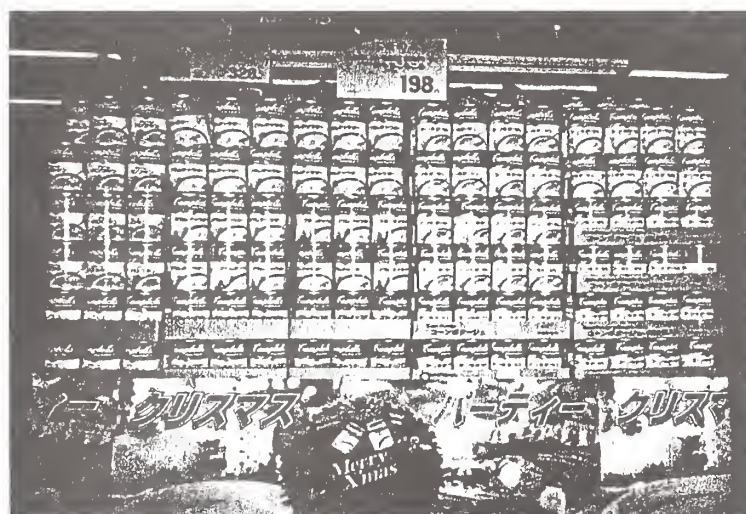
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AGRICULTURAL OUTLOOK FORUM '97



## EXAMPLE: JAPAN



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## MARKET POTENTIAL:

- Large population (125mm)
- High income (\$26,000) per capita
- High soup consumption (\$550 mm soup market)
- Trade barriers coming down (7% tariff)

## PRODUCT:

- Special varieties (Corn Potage, Double Corn, Cream of Mushroom, Cream of Pumpkin, Cream of Carrot New England Clam Chowder)
- Japanese labels

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*CHARTING A NEW COURSE*



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## IMPLEMENTATION:

- Manufacturing in Sacramento, CA
- Joint venture with Nakano Vinegar
- Brand power - "Mr. Campbell"



## FINANCIAL:

- Pricing acceptable

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*CHARTING A NEW COURSE*

# **FARM FINANCES AND FINANCIAL MANAGEMENT: OUTLOOK IN A CHANGING ENVIRONMENT**

by

Janet Perry, Jim Johnson, Mitch Morehart, Jim Ryan, and Bob Hoppe  
Farm Business Economics Branch  
Rural Economy Division  
Economic Research Service

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Omni Shoreham Hotel, Washington, D. C. , February 24 and 25, 1997*

## **FARM FINANCES AND FINANCIAL MANAGEMENT: OUTLOOK IN A CHANGING ENVIRONMENT**

Janet Perry, Jim Johnson, Mitch Morehart, Jim Ryan, and Bob Hoppe1

This time last year, when we reviewed the farm finance situation and outlook, we presented a status-quo scenario. While we expected continued movement toward more market orientation, some believed that commodity programs would still be in place in some form. The effects of NAFTA and GATT were just beginning to be felt. The Internet was just starting to boom. Today, we recognize that people in the agricultural sector face an increased risk of business failure, and increased opportunity for success.

### **Changing agricultural environment brings important challenges**

Farmers, input suppliers, processors, distributors, and consumers are influenced by, and respond to, markets and expectations about the future. Some decisions require long-range planning. As farmers adapt, changes will be made in their production, marketing, and financial arrangements. Continuing research on appropriate responses under different environments could improve the adaptive capability of agriculture. The willingness and ability to take on risk is not just an attitude of the farmer. Farm structure and the operating environment are important dimensions in the decision-making process. Farmers face challenges on many fronts--

- Expanding markets through international trade
- New farm legislation
- Continuing technological changes
- Continuing structural adjustments
- Heightened expectations for environmental protection

Farm management is risk management. Historically, USDA has provided publicly funded research and information activities for farmers. Information is the key link in the farmer's ability to develop plans to evaluate and cope with risk. Responses include:

- Assessing the competitiveness of U. S. agricultural production.
- Monitoring of the interaction among farm production decision makers, their goals, and their use of adaptive management strategies.
- Positioning USDA to provide products that enhance the understanding of structure and the financial performance of U. S. farms and the farm sector and the linkages between farming and other sectors of the economy.

### **Farm income may be lower**

Lower net farm income is forecast for 1997. Lower crop cash receipts are expected to contribute to the \$40 billion forecast, which is down from the record \$52 billion expected for 1996 and the 1990-95 average of \$43 billion. Higher receipts for cattle due to declining herd size will be largely offset by declining dairy receipts. Expenses are expected to increase, but by a smaller percentage than in recent years as declining grain prices lead to lower feed expenses.

As profit margins get squeezed, a premium will be placed on what have traditionally been considered secondary elements of farm management:

- (1) **finance**, which includes decisions about what assets are needed, and how will they be acquired, and
- (2) **marketing**, which involves decision on when, how and where to sell results of production.

Many farmers will need additional skills to better deal with variation in income that will come with increased reliance on the market.

Commercial farm operations procure capital assets in a variety of ways. Typically, farmers purchase products through some type of debt financing. Many farms can use internal funding from earnings derived from farm and nonfarm income sources, sometimes from multiple owners. For some additional resources come through contractual arrangements, while others gain temporary use of needed assets by renting land and leasing equipment. When farmers bring lenders, landlords, contractors, partners, and off-farm employers into the picture, the coordination of farm decision-making and control becomes more complicated, and may require a new set of managerial skills.

### **Where are the profits, the losses?**

Net cash income is forecast to decrease in 1997 on most farms that specialize in crops. The decline will be largely due to lower receipts rather than higher expenses. Incomes of farms that are heavily dependent on corn or wheat as a source of income will be most affected by lower market prices. Highly specialized wheat farms tend to be in the Plains regions, and in parts of Montana, Washington and Idaho. Cotton and tobacco receipts are also forecast to be lower.

The decrease in net cash income is spread across farms of all sizes, with the largest declines forecast for farms that have annual sales less than \$250,000. These farms generally depend more on wheat or corn for income than the largest farms.

Prices depressed by oversupply were the major reasons for lower cattle's receipts in the mid 1990s. Severe drought in 1995-96 caused herd liquidations beyond normal cattle cycle expectations. By the end of 1996 producers had reduced the herd by nearly two million animals, contributing to an improved price outlook for 1997. Further relief is expected from lower feed expenses. Most cattle operations weathered the market downturn because they had relatively strong overall financial position. Many operations with negative incomes had enough working capital to offset the loss, or could borrow the full amount of the shortfall against existing assets.

Cattle receipts and hog receipts are diminishing in importance to total livestock receipts. Paralleling that decline is an expansion in receipts from broilers, pointing to a long-term trend of adjustments in the livestock industry that reflect changes in consumer preferences. Dairy and egg revenues have also shown a declining share of livestock receipts over the past decade. These market changes make it imperative for farmers to re-evaluate their positions, then make production and financing decisions to follow.

## **What are expense items to keep an eye on?**

Expenses will be about \$184 billion in 1997, up less than half a percent from the 1996 forecast. As expenses continue to rise, some of the components of total expenses bear watching. Feed, petroleum products (fuel, agriculture chemicals) and labor contribute to almost half of the average farm's expenses. Feed expenses are expected to be lower, due to increased supply, but poor yields can change prices quickly. Price of petroleum products is determined outside the farm sector and is a function of U.S. oil stocks and the world market. This winter's stocks have been low, and supply is not expected to increase. Coupled with an increase in acreage, higher prices for fuels and agricultural chemicals may be the result. Labor markets continue to be tight and those farms depending heavily on labor (fruits and vegetables especially) may face rising expenses.

Another area of concern for the sector is rising rental rates. Land rental rates will increase as land prices go up. Forty percent of the acres used in farm production are rented and large farms have a larger share of rented versus owned land. Additional uncertainty is created by a restructuring of the landowner--land operator relationship. If land values are expected to increase rapidly, landowners are reluctant to offer long-term leases. Farmers may find themselves bidding for land that they have traditionally rented without competition.

Inflation, while lower than historical rates, is expected to pick up slightly in 1997. Continued tight labor markets slightly accelerate wage increases. Additional mild upward inflationary pressure is expected from a weakening of the dollar and stronger overall growth in developed countries that reduces excess manufacturing capacity abroad. Increases in farm income have lagged behind inflation over the past decade, and any future increases are expected to continue to lag behind the rate of inflation.

If farmers' profit margins decline, financial management should receive more attention. Input price fluctuation can be effectively managed through contracts with input suppliers. Other expenses may be managed by hiring consultants, contract labor, and custom feeding, planting, and harvesting.

## **Assets and Debt**

Farm assets are expected to top \$1 trillion in 1997. The value of farm real estate is expected to grow 6 percent in 1997. Farm business debt is anticipated to approach \$160 billion by the end of 1997, its highest level since 1985 and the fifth consecutive year of rising farm debt. Rising farm sector assets and equity values and lower farm income suggests slightly lower rates of return on farm assets and equity.

The expansion in outstanding loan balances in 1997 follows a projected debt increase of almost \$5 billion in 1996. Annual changes during 1994 through 1996 reflect the largest annual percentage increases in outstanding loan balances since 1982. The recent rise in loan balances can be at least partially attributed to farmers' positive view of the future of the sector, and relatively low interest rates. Non-real estate debt is expanding and farmers appear willing to borrow to replace capital



stock. Lower incomes available to service debt, coupled with lenders' emphasis on loan approval based on repayment ability rather than collateral values, will probably restrain any major increase in farmers' borrowing activities.

U.S. farm real estate values are expected to rise for the 10th consecutive year in 1996. Even in real terms, land prices will increase about 5 percent and 1997 is expected to be the 6th year of real increases. Upward pressure on land values is likely related to relatively strong crop prices, continued urban land pressures, and provisions of the new Farm Act that eliminated most acreage planting restrictions. Key factors prompting continued strong demand for farm real estate are: long term expectations for robust although variable farm income, an upbeat long-term outlook for exports, and stable interest rates.

Rising land values reflect farmers' longer term expectations of profitability in the sector. However, if farmers use their available credit lines more fully in 1997, they expose themselves to additional financial risk. Rented land accounts for about 40 percent of the value of all assets used in farm operations, and large farms have a larger share of rented versus owned land. Sometimes the market changes quickly and large capital items are difficult to acquire or dispose of quickly. Renting rather than buying land is a risk management strategy that allows farmers more flexibility in response to market conditions. It allows the owner to maintain possession and receive a return for idle assets.

While recent increases in farm business debt have not been burdensome, concentration of debt owed by tenant and beginning farmers may be growing. Most rented land has belonged to the same owner for many years and the land is fully paid for. Nonoperator landlords, often retired farmers and their heirs, owe less than 10 percent of all farm business debt. Maintaining ownership allows the retired farmer to create a more valuable estate while receiving a return on his or her investment. Ultimately, this rented land may be sold to other farm operators, current tenants, neighboring farmers wanting to expand their operations, or beginning farmers. As farmers borrow money to finance land purchases, we would expect a gradual shift of debt from nonoperator landlords to farm operators.

Although some operators may have trouble generating sufficient farm income to meet their debt service requirements, there are no signs of widespread financial stress. Farmers are comfortable making production decisions, but typically are less pro-active in the marketing of their products and financing of the business. Thus, it becomes important that farmers make effective decisions about the planning, organization, and financial control of their operations to generate the cash needed to pay any extra debt obligations.

### **Expanding markets**

Markets for agricultural products are expanding across national borders. Trade is expected to reach a record \$60 billion to \$80 billion by 2005. In 1996, exports of beef were expected to increase 17%, with additional purchases from Japan, Korea, Canada, Mexico. One-quarter of the U.S. corn crop is exported; one-third of the soybean crop and one-half of the wheat crop. Corn exports reached 2.2 million bushels (3rd highest year), and wheat reached 32.5 million tons, a

33% increase. NAFTA and GATT, plus 20 other recently negotiated international agreements are opening new markets. To compete for these new customers, skills in marketing, currency exchange, and perhaps even knowledge of language and international law will be required. A change in the climate or yield in one country can have impacts on U.S. exports markets, expanding or contracting competition. And, the political nature of trade agreements and the reliance on international markets introduce new risks for the farmer.

### **FAIR Act brings increased market orientation, greater market risk**

The Federal Agriculture Improvement and Reform Act severed the link between income support payments and farm prices by providing annual fixed, but declining payments for the next 7 years to participating farmers. Payments are based on historical production and yields, but are not linked to current production, prices, or factor use. Marketing loans are still in effect, but they do not protect against crop loss, and are set low enough that the loan has limited price protection value. Since loan rates are capped, the low safety net could be further eroded by inflation.

Constraints on individual farm decision-making imposed by previous legislation are greatly reduced, giving farmers greater flexibility to make changes in their business plans. However, farmers cannot adjust supply in response to price as quickly as other sectors. If farmers respond to high prices at harvest by planting more the next year, excess supply and lower prices may be the result. If supplies are tight and feed prices high, the only option for supply control is early release of CRP lands, which are commonly marginal lands. These lands would not add much to production, and certainly not quickly enough for financially vulnerable livestock operators to benefit from lower prices.

The Act focuses on market development and expansion through export enhancement, and on pilot projects to help farmers adjust to the new market environment. The Act establishes a commission to conduct a comprehensive review of changes to production agriculture and the appropriate role of the Federal government in it. One role USDA has chosen is to underwrite crop insurance. While purchase of crop insurance is no longer required to be eligible for farm program benefits, producers must waive all emergency crop loss assistance. Several pilot programs for revenue assurance have begun. These programs would indemnify the producer if gross income is less than a predetermined amount and is available for certain producers who elect to receive insurance against loss of revenue. The Secretary has recently approved expansion of Crop Revenue Coverage (CRC) for corn and soybeans, new CRC programs for cotton, grain sorghum and spring wheat, and expansion of Income Protection (IP) for grain sorghum and soybeans. Both insurance plans are designed as alternatives for a standard multiple peril crop insurance policy.

### **Risk management becomes more important**

As farm income becomes more variable, risk management becomes more important. The income any one farmer earns may become more variable as agriculture becomes more markets oriented. As supply or prices of products change, new technology is adopted, or environmental constraints appear, farmers could experience higher income, or cash flow difficulties, changing expenses, and

more debt. While aggregate income for the sector, or the average net income per farm, could remain stable, variability in income for individual farmers could increase. The probability of extremes in receipts, both high and low, require farmers to plan more carefully their finances, and production and marketing of goods.

### **Basic Strategies Farmers Can Use**

Approximately 1/3 of all farmers, but more likely commercial farmers, used government commodity programs as a risk management tool in 1995. The 6 percent of farms that had sales over \$250,000 received 28 percent of payments and produced 46 percent of program commodity sales. These farmers are the most directly affected by changes in the law, but the whole sector must adjust. Payments are set by law. Farmers can choose to receive the first half of each fiscal year payment in either December or January, implying attention to tax strategies and cash flow management.

Payments are independent of price. However, farmers will no longer have the countervailing protection of supply control and will be exposed to market prices. Other than the decision of how much to plant, marketing strategies such as spreading sales over the year, use of futures, hedging, forward-contracting, or options contracts can help farmers enhance their receipts. Even smaller farms can use marketing strategies. One such strategy is direct sales— at roadside stands, farmers' markets, through mail-order, or by subscription. Elevators can combine the production of several smaller farms into a contract, and livestock producers can contract feed in relatively small quantities. Just by timing the sale of products to take advantage of higher late-cycle prices instead of selling all at harvest can substantially add to the farmer's bottom line.

### **Technological advances--don't underestimate their effect**

Technological advances, especially biological and computer technology, continue to affect farming. These new technologies may revolutionize agriculture much like tractors did in mid-century. Just as farmers replaced horses and people with power equipment, so, farmers will need to use other technologies to their benefit. Producers that apply these new technologies to create products and services to meet society's changing needs and preferences will capture a larger share of the market. The market is driven by consumers and the successful farmer will tailor farm products to meet consumers' demand, and will provide those products to the next step in the production process in a timely manner.

Farmers' willingness to take a risk, and risk-bearing ability given their equity and cash flow positions, affect the structure and organization of their farms. Farmers' attitudes also affect strategies that they may employ to reduce or manage risk. Some farmers are willing and able to take high risks; others may wish to reduce risk. Adoption of new technology is risky. At first, an innovation is conceived and only a few will even examine its possibilities. Then gradually, the early adopters--those will to try new things although no one else does--will begin to use or apply the concept. As these early adopters show positive results, ever more people will apply the concept. Finally, those that wait to try new things until they are proven by others will adopt the practice or be left behind.



From survey results, we find evidence of each stage of adoption. 38 percent of farmers said they used the same technology as other farmers in their county. 21 percent said that they tried new technologies although only a few other farmers used them, and 3 percent said that they were usually the first to try new technologies. Early adopters were more likely to have larger farms (almost 10 percent of farmers with gross sales more than \$250,000 were in this category) and to generate higher returns. Even more telling, 1/4 of operators with small farms--sales less than \$50,000--said that they had no particular strategy of technology-use at all!

How do farmers use technology to improve their returns? Farmers can take advantage of a variety of technologies to better target and market to customers who buy agricultural products. New processing and packaging bring the opportunity to provide products to consumers in a variety of forms. Applications of biotechnology can produce products with specific characteristics, such as tomatoes that are ripe and juicy, but still package and travel well. Computer technology allows the processing of vast amounts of data so that farmers can track production expenses, identify emerging markets, and plan a shift in their efforts toward those new consumer preferences. To meet these challenges, farmers may need to change their procurement strategies, production and processing methods, or marketing approaches. These changes will alter the structure of farms and of rural communities.

Changes are already occurring. One change is the introduction of the Internet to agriculture. For example, just searching the Internet for the word "agriculture" brought up an index of 113 entries about pest control, 80 on machinery, 156 on livestock and 62 organizations. ERS has a homepage that allows electronic access to hundreds of publications, tables, and briefings. The Farm Business Economics Briefing Room has documents on farm income, farm costs and returns, farm structure, farm households, and current farm financial performance.

### **Structure of agriculture affects distribution of farm income**

The number of farms has declined for decades, and we have no reason to expect this trend to reverse. In fact, because almost a quarter of farm operators were at least 65 years old and another 22 percent between 55 and 64 years old in 1992, many farms will soon change ownership. To some extent, adjustments have already occurred. Most of these elderly operators have already scaled back their operations, and the 17 percent of all U.S. farms had operators who reported that they were retired, but continued to farm. These farms accounted for only 2 percent of agricultural production in 1993.

Despite declining numbers of farms, data from the census of agriculture show that family-owned farms (individual operations, partnerships, and family corporations) are not losing their share of U.S. agriculture to non-family corporations. Family corporations, however, increased their share of both farms and sales during the 1978-92 period.

Changing structure encourages new ownership, operating and financing arrangements, and the flow of assets to the production process. For example, growth of contracting arrangements could change rates of entry or exits and the need for capital by the farmer. Another change in

operations is the hiring of professional managers and consultants. The dynamic nature of farm businesses often requires special talents for a short time. These services augment the farmer's production, marketing, and financial arrangements. Farmers can purchase services such as advice and consultation on conservation practices, regulatory compliance, investment analysis, bookkeeping for business planning, and marketing services, as well as production practices such as tillage, pesticide use, animal waste disposal, and harvesting. When farmers decide to purchase services rather than do those jobs themselves, they can shift their attention to other aspects to the business.

Commercial farms today may require resources than can be provided by a single household. According to the traditional view of farming, each farm is associated with a single operator household that receives all the farm's net income. By 1993, however, 26 percent of farms had multiple suppliers of assets and receivers of net income. Single-household farms are still the norm. These farms are closely held (legally controlled) by a single household, and the household shares net income from the farm with no other household. However, more and more, farms also have share landlords or production contractors with which it shares output. And, as farms get larger, production by family farms has been shifting from proprietorships to arrangements that include other family members, allowing farm families to pool resources.

### **Farmers are using contracts to manage risk**

Some important structural changes have occurred in the way farm production and marketing are conducted. Industrialization has led to farms specializing in a particular commodity or stage of production. In the production process, decision-making is divided and people tend to specialize in ownership of assets, management, and farm work. For example, in a vertically integrated operation, the same firm typically owns several farm-related businesses, such as hatcheries, feed mills, processing plants, and packing facilities. An integrator may also own farms or, more typically, contract with farmers to produce commodities.

Another aspect of industrialization is the increase in reliance on production and marketing contracts as farmers have become less dependent on terminal markets and spot pricing to market their goods. Most farms (89 percent) had only cash sales in 1993. But contracting or vertical integration had become dominant modes of production and marketing in the broiler, turkey, egg, milk, and specialty crop markets, and is becoming increasingly common in hog farming. The remaining 11 percent of U.S. farms had at least one marketing or production contract, but these farms accounted for about 40 percent of production, as measured by gross sales.

The increasing use of contracting is commonly identified with the industrialization of agriculture. In part, industrialization arose as consumers began to buy food products rather than food commodities. Processors need a steady supply of farm products of known quality and specifications to process. Contracting and vertical integration help provide these farm products, and so reduce processor risk.

Contracting can also reduce marketing and production risks for producers. Because marketing contracts set a price in advance for output, they reduce marketing risk. Since production



contractors own the commodity produced, make most of the production decisions, and supply most inputs, they assume a substantial part of the risk associated with production and marketing of the product. The actual distribution of risk, of course, depends on the terms and conditions of the contract and the bargaining strength of the farmer and the contractor. In exchange for reduction in risk, the decision of what to produce (contract for) and at what price is moved away from farmers into the realm of the contractor or processor. Many contracts specify the production practices and supply the inputs, but farmers still have room to exercise their management skills. Contractors expect production management and reward good managers with bonuses. Farmers will still make financial decisions, and build equity in the business.

### **Environmental impacts becoming more important**

Agriculture in the 21st century will be constrained by environmental concerns--

- *in local law* that zone the location of animal confinement yards,
- *in federal laws* that govern use of chemicals and soil erosion, and
- *in international laws* that regulate greenhouse gas emissions or sanitary and phytosanitary conditions.

Rather than defend themselves against charges of degradation of the environment, and risking fines and/or legislation requiring environmentally friendly practices, some farmers are choosing to adopt sustainable farming practices.

Many of these practices-- erosion control, animal waste treatment, or setting aside land for wildlife or wetlands--could result in additional costs for which the 1996 legislation has provisions for some cost-sharing. The interest in natural resource conservation brings opportunities for farmers to tighten the link between their products and the consumer, but also costs for implementation and/or legislative fines. Besides several smaller programs the following programs are authorized:

- Conservation Reserve Program continues
- The Environmental Quality Incentives Program (EQIP)
- Wetlands Reserve Program

CRP continues under the FAIR Act, with enrollment up to 36.4 million acres. Early-outs are permitted for land enrolled for at least 5 years and is less environmentally sensitive. New enrollment of environmentally sensitive land is permitted to replace the early-outs and contracts that expire. Three priority areas were established for CRP--Great Lakes region, Long Island Sound Region, and the Chesapeake Bay Region. The program includes \$50 million for 1996-2002 to be funded for cost-sharing of the Wildlife Habitat Incentives Program.

EQIP is authorized at \$1.3 billion over 7 years to provide technical, educational, and cost-share assistance and incentive payments to producers in carrying out structural and management practices to protect soil and water resources. At least half the fund is allocated to environmental concerns associated with livestock practices. All but the largest operations are eligible for cost-sharing. They are eligible for technical assistance, educational assistance, and incentive

payments for animal waste facilities, plus cost sharing for other approved practices.

The Wetlands Reserve Program allows farmers to restore up to 975,000 acres of wetlands and enroll those acres into paid easements. In addition, restoration of the Everglades is funded up to \$200 million from the Treasury. An additional \$100 million is authorized through the sale or swap of other federally owned land in Florida. Purchase of private land by the Fed in the Everglades Agricultural Area is permitted.

Farming activity will be governed by other laws like the Comprehensive Environmental Response, Compensation and Liability Act, (CERCLA) amended in 1996. This law requires that farms meet certain EPA standards for point-source pollution. International trade accords contain environmental agreements. One that will affect agriculture is the Montreal Protocol on Substances that Deplete the Ozone, which restricts the import and export of chemicals such as methyl bromide--a broad-spectrum pesticide. It will be up to farmers to publicize their efforts. Farmers will pay the costs of carrying out environmentally friendly practices, or pay the costs of fines, strict legislation, and adverse publicity

### **Implications in a Changing Environment**

Tried and true management strategies to respond to tighter margins such as controlling costs or increasing efficiency and productivity are still important. However, the current environment demands more. Successful management requires planning and control of the marketing and financial aspects of the business as well. In the short term farmers will find that:

- Increased globalization of agricultural trade will open new markets for farmers, but also increase competition.
- Increased reliance on market transactions will signal farmers what to produce, how to produce and at what price they can afford to produce. It will also expose farmers to the risk of extremes in income.
- Technology will expand opportunities to target markets, but increased expense and entrepreneurial skill will be needed to implement it.
- Pressure on commercial farms to manage resources through innovative organization, production, and marketing arrangements will continue.
- Agriculture will be under pressure to respond to enhanced awareness of environmental impacts of agriculture.

Increased emphasis on returns to management rather than returns to capital assets will generate the needed higher returns. Successful managers will combine financial and marketing skills with the production management skills that have dominated in the past.

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